

J. B. Mark



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1840
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OBSERVATIONS

ON THE

GENUS UNIO,

TOGETHER WITH

DESCRIPTIONS OF NEW SPECIES IN THE FAMILIES NAIADES,
COLIMACEA, LYMNÆANA, MELANIANA
AND PERISTOMIANA.

WITH NUMEROUS PLATES.

BY

ISAAC LEA,

MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY,
ETC. ETC.

V
VOL. ~~NX~~

PHILADELPHIA:
PRINTED FOR THE AUTHOR.

2. 0. 1914

at 2 miles from the

F. B. Wood
and the others

To F. B. Meek Esq
with the compliments of the Author.

OBSERVATIONS
ON THE
GENUS UNIO,
&c.

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J. F. O. Hunt
at the office of the Auditor.

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F. B. March 1840
with the assistance of the author.

OBSERVATIONS

ON THE

G E N U S U N I O,

TOGETHER WITH

DESCRIPTIONS OF NEW SPECIES IN THE FAMILIES UNIONIDÆ, COLIMACEA
AND MELANIANA.

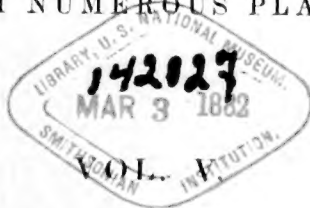
READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY, AND ORIGINALLY
PUBLISHED IN ITS TRANSACTIONS.

BY

ISAAC LEA,

MEMBER OF THE AM. PHIL. SOC.; OF THE ACAD. OF NAT. SCIENCES OF PHILADA.;
OF THE ZOOL. SOC. OF LONDON; OF THE IMPERIAL
SOC. OF MOSCOW, &c. &c.

WITH NUMEROUS PLATES.



PHILADELPHIA:
PRINTED FOR THE AUTHOR.

720241



TO MAJOR JOHN LE CONTE,

MY DEAR FRIEND:

Will you permit me in this way to acknowledge my obligations to your great kindness and liberality, in furnishing me, during so many years, with numerous new species of our fluviatile molluscs? The pains you have always taken in bringing to light new forms, may readily be understood by looking through this and my previous volumes on this interesting subject. I feel grateful for the untiring assiduity you have given to promote my objects, and therefore it is with peculiar pleasure that I present you with this volume.

Truly and

Faithfully yours,

ISAAC LEA.

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NEW FRESH WATER AND LAND SHELLS.*

It is now some years since I presented to this society a continuation of my discoveries of new forms from the fresh waters and soil of the United States. Since that period, owing to the kindness of many valued friends, I have been enabled to get together a much larger number by far, than could have been anticipated. These have come chiefly from localities hitherto little examined, and which have produced new species more or less interesting. It will be observed that many are from Dr. Barratt, of Abbeville District, S. C., from Mr. Tuomey, of Alabama, Dr. Hale, of Alexandria, Louisiana, Prof. Powell, of Memphis, Major Le Conte, who procured them from Florida and Georgia, President Estabrook, of Knoxville, Tenn., Mr. Joseph Clark, of Cincinnati, Mr. C. M. Wheatley, of New York, and other kind friends. To them all, I return my sincere thanks for their liberality, and I trust that they will be induced not to flag in the cause of American science, but rather to be encouraged in the development of these new organic forms, which, in this branch of Zoology exist in such vast profusion, and in so extended a number of species, in the United States.

Notwithstanding the vast number of well characterized species of the Family *Unionidæ*, (as there are also in the Family *Meluniana*,) there are continually new and distinct forms brought to our notice, which well deserve the attention of the American Zoologist.

I am aware that many persons doubt the existence of so extended a production of species, but this arises from the want of a knowledge of them, closely cultivated and analytically examined. An organic form, instituted by nature must be recognised as distinct, for it will remain in a state of autonomy to the end of its term. It is the duty of the zoologist to bring to the investigation an eye practised in discrimination, and a judgment experienced in analysis, as well as also an honest intention of purpose, that he may give the best and most accurate results to his investigations.

[* Read before the American Philosophical Society, March 5, 1852, and published in the Transactions, Vol. X., New Series.]

UNIO SORDIDIS. Pl. XII. Fig. 1.

Testâ lævi, ellipticâ, subcompressâ, inequilaterali, posticè rotundatâ; valvulis subcrassis; natibus prominulis; epidermide rufo-fuscâ, striatâ; dentibus cardinalibus parvis; lateralibus longis subrectisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, rather compressed, inequilateral, rounded behind; valves rather thick; beaks slightly prominent; epidermis reddish-brown, striate; cardinal teeth small; lateral teeth long and nearly straight; nacre white and iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet.

Diam. .8,

Length 1.3,

Breadth 2.4 inches.

Shell smooth, elliptical, rather compressed, inequilateral, rounded before and behind; substance of the shell rather thick, thinner behind; beaks slightly prominent and nearly terminal; ligament long and thick; epidermis reddish-brown, obtusely rayed, with obscure equidistant marks of growth; umbonial slope rounded; cardinal teeth very small and striate, single in the right and double in the left valve; lateral teeth long and nearly straight, separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices nearly in the centre of the cavity of the beak, under the cardinal tooth; cavity of the shell shallow; cavity of the beaks very shallow and subangular; nacre white and iridescent.

Remarks.—A single imperfect specimen only of this was received by me, and I hesitated for some time to describe it, in hopes of getting more to determine its characters better. It is certainly very much like the widely distributed *U. complanatus*; but it seems to me to differ in its form, being more rounded behind, more rounded over the umbones, and more compressed over the umbonial slope.

UNIO GIBBESIANUS. Pl. XII. Fig. 2.

Testâ lævi, ellipticâ, subcompressâ, inequilaterali, posticè subbiangulatâ; valvulis subcrassis; natibus prominentibus; epidermide luteo-fuscâ, radiatâ, striatâ; dentibus cardinalibus parvis, tripartitis; lateralibus prælongis subrectisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, somewhat compressed, inequilateral, subbiangular behind; valves rather thick; beaks prominent; epidermis yellowish-brown, radiated, striated; cardinal teeth small; lateral teeth very long and nearly straight; nacre white and iridescent.

Hab. Abbeville District, S. C. Louis R. Gibbes, M. D.

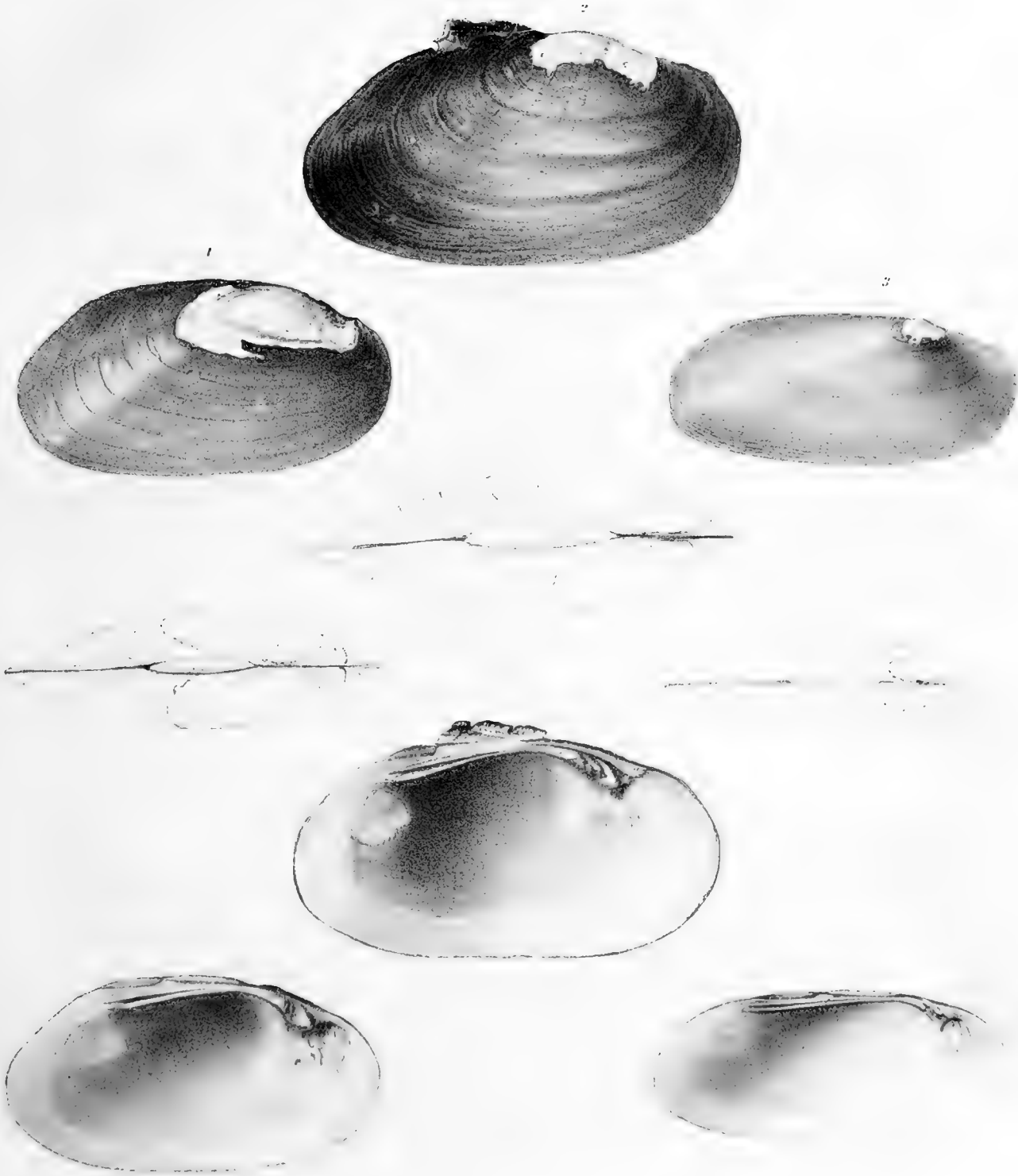
My cabinet.

Diam. 1,

Length 1.5,

Breadth 2.8 inches.

Shell smooth, elliptical, somewhat compressed, inequilateral, rounded before and subbiangular behind; substance of the shell thick; beaks prominent and submedial; ligament long and very thick; epidermis yellowish-brown, obscurely radiated, roughly striate near the margin, smooth on the umbones, marks of growth nearly equidistant and distinct; umbonial slope rounded; cardinal teeth small, slightly elevated, pointed and tripartite; lateral teeth very long, nearly straight and thickened at the posterior end, separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cica-



1 *Pinus sordidus*
 2 " *Gibbesiopsis*
 3 " *perstratus*

trices nearly in the centre of the cavity of the beaks, on the inferior posterior part of the cardinal tooth; pallear cicatrices distinctly impressed; cavity of the shell shallow, cavity of the beaks shallow and subangular; nacre white and iridescent.

Remarks.—It is to be particularly regretted that a single specimen only of this species should have been received from Dr. Gibbes. The cardinal teeth in *both valves are tripartite*. They are distinctly divided into three lobes, of nearly equal size and form. This is so unique that I have inserted it with some hesitation as a permanent character, tripartition being so unprecedented. It may possibly be accidental. Should other specimens prove this form to be persistent, this species will present an anomaly peculiarly its own. The lateral teeth are, as usual, single in the right and double in the left valve; but the terminal inferior portion is remarkably enlarged and thickened in the latter valve, so as to run beyond the superior portion. The marginal portion of the disc is remarkably furnished with imbricate epidermal matter. It has somewhat the outline of *U. complanatus*, but may easily be distinguished from that species by its being more elevated in the beaks, in its imbricate margin, and in the form of the teeth.

UNIO PERSTRIATUS. Pl. XII. Fig. 3.

Testâ lævi, valdè transversâ, valdè compressâ, submarginatâ, valdè inæquilaterali, posticè subbiangulatâ; valvulis tenuibus; natibus parvis, vix prominentibus, ad apicem undulatus; epidermide luteo-fuscâ, perstriatâ; dentibus cardinalibus parvis, obliquis; lateralibus prælongis rectisque; margaritâ albâ et iridescente.

Shell smooth, very transverse, very much compressed, submarginate, very inequilateral, subbiangular behind; valves thin; beaks small, scarcely prominent, undulated at the tip; epidermis yellowish-brown, very much striated; cardinal teeth small, oblique; lateral teeth very long and straight; nacre white and iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. .5,

Length 1,

Breadth 2.3 inches.

Shell smooth, very transverse, very much compressed, slightly emarginate, very inequilateral, subbiangular behind, obtusely rounded before, posterior slope wide and flattened; substance of the shell thin; beaks placed near to the anterior margin and furnished with minute undulations at the tip, scarcely prominent, but rather pointed; ligament long and thin; epidermis yellowish-brown, with numerous imbricate striæ covering nearly the whole of the disks, and with only one or two distant marks of growth; umbonal slope biangular and flattened; cardinal teeth small, oblique, double in the right and single in the left valve; lateral teeth very long, straight and thickened at the posterior ends; anterior cicatrices distinct; dorsal cicatrices placed under the plate between the cardinal and lateral teeth; cavity of the shell exceedingly shallow; cavity of the beaks very shallow and rounded; nacre white and iridescent.

Remarks.—Dr. Barratt sent me four specimens of this species, which may easily be distinguished by its peculiar striated epidermis, and its compressed form. It scarcely belongs to that large group of which the *U. complanatus* is the type, but certainly borders on it. The nacre of three of the specimens is white, slightly tinged with blue. The fourth specimen is purplish. The lines of growth are very remarkable, being few and

very distant, neither of the specimens having more than two, and two of them having only one line of growth. In outline it closely resembles *U. strigosus*, (Nobis,) but is a rougher shell, and thinner.

UNIO TUOMEYI. Pl. XIII. Fig. 4.

Testa lævi, ellipticâ, subcompressâ; valvulis subcrassis; natibus vix prominulis; epidermide luteo-fuscâ; dentibus cardinalibus subgrandibus; lateralibus longis, subcrassis curvisque; margaritâ iridescente, colore salmonis tinctâ.

Shell smooth, elliptical, rather compressed; valves somewhat thick; beaks slightly prominent; epidermis yellowish-brown; cardinal teeth rather large; lateral teeth long, rather thick and curved; nacre iridescent, salmon coloured.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet and cabinets of Dr. Barratt and Mr. Tuomey.

Diam. .8, Length 1.3, Breadth 2.6 inches.

Shell smooth, elliptical, rather compressed, subangular behind, rounded before, slightly angular on the posterior slope; substance of the shell somewhat thick; beaks slightly prominent, with minute undulations at the tip; ligament rather long and thin; epidermis yellowish-brown, shining, with indistinct rays on the posterior portion; cardinal teeth rather large, somewhat pointed, single in the right and double in the left valve; lateral teeth long, curved and thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the cavity of the beaks; cavity of the shell shallow; cavity of the beaks small and slightly angular; nacre iridescent and salmon coloured.

Remarks.—There were seven specimens of this species among the shells sent to me by Dr. Barratt and Mr. Tuomey. They are of different ages, and nearly allied to *U. Barratti*, herein described, but may be distinguished by being more compressed and less transverse. All of the seven specimens before me have salmon coloured nacre, except one, which is mixed with a tinge of purple. Other specimens may likely be found with white and purple nacre.

UNIO BARRATTI. Pl. XIII. Fig. 5.

Testa lævi, transversâ, subinflatâ; valvulis subcrassis; natibus vix prominulis; epidermide virido-fuscâ; dentibus cardinalibus grandibus; lateralibus longis, subcrassis subcurvisque; margaritâ vel albâ vel purpurâ vel colore salmonis tinctâ.

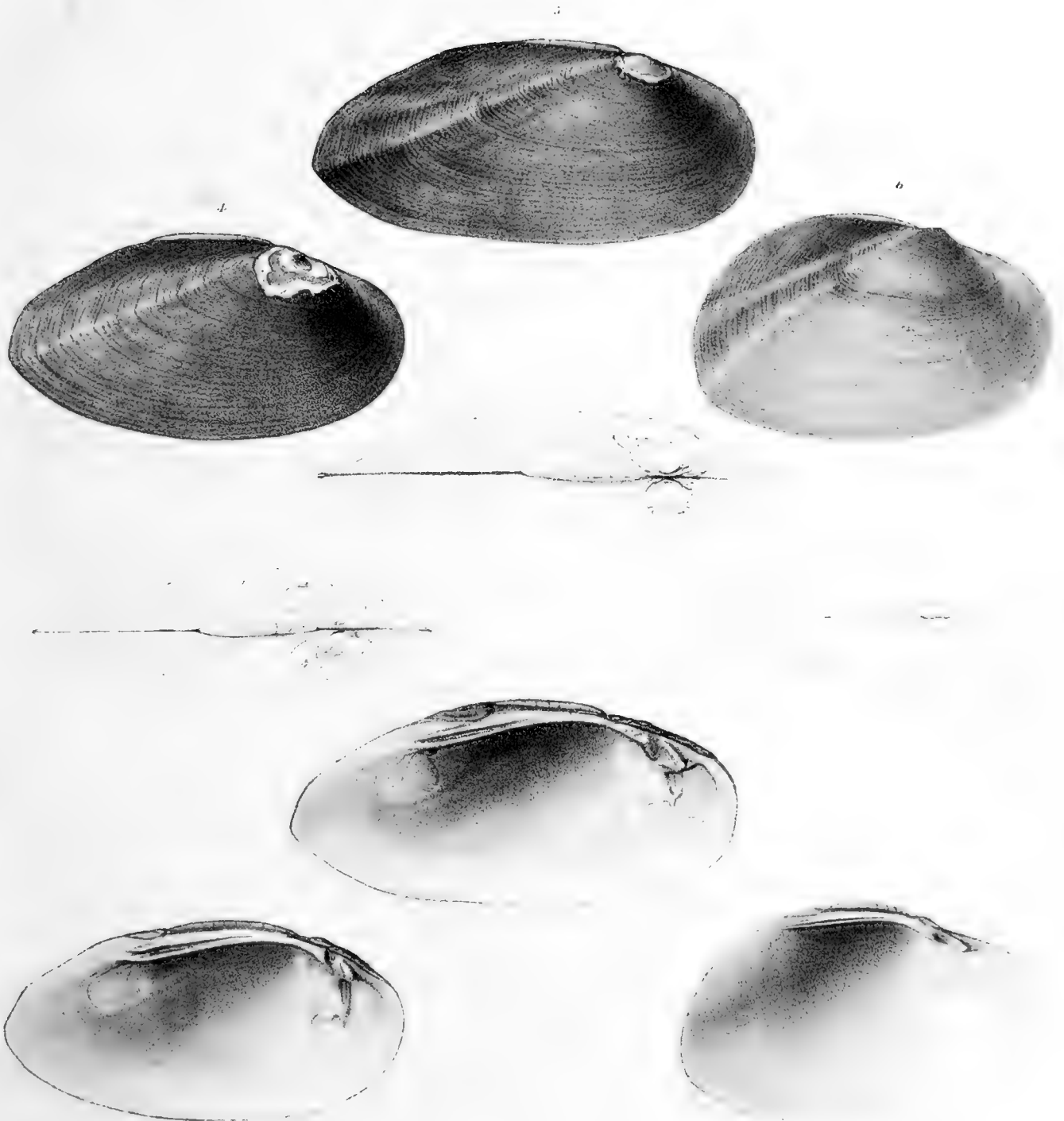
Shell smooth, transverse, slightly inflated; valves somewhat thick; beaks slightly prominent; epidermis greenish-brown; cardinal teeth large; lateral teeth long, somewhat thick, and rather curved; nacre white-purple or salmon coloured.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet and cabinets of Dr. Barratt and Mr. Tuomey.

Diam. .8, Length 1.3, Breadth 2.9 inches.

Shell smooth, transverse, slightly inflated, angular behind and rounded before, angular on the posterior slope, subearinate on the posterior dorsal margin; substance of the shell somewhat thick; beaks slightly prominent, with minute undulations at the tip; ligament



4 *Unio Tuomeyi*.
 5 " *Barrallii*.
 6 " *decoratus*

rather long and thin; epidermis greenish, clouded with brown, slightly polished, with rather minute, indistinct rays; cardinal teeth large, pointed, single in the right and double in the left valve; lateral teeth long, somewhat curved and thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks small and rather angular; nacre white, purplish, or delicately salmon coloured and iridescent.

Remarks.—Among many interesting species—several of which were new—received from Dr. Barratt and Mr. Tuomey, were four of this species. One is an adult, the other three are young. It has somewhat the outline of *U. rectus*, Lam., and has on the exterior a resemblance to *U. nasutus*, Say, but is a thicker shell. It is not so cylindrical as the *rectus*, nor so wide. It is allied to *U. Tuomeyi*, but is a wider species.

UNIO DECORATUS. Pl. XIII. Fig. 6.

Testâ oblongâ, valdè compressâ, inæquilaterali; valvulis subtenuibus; natibus prominulis, compressis, ad apices undulatis; epidermide luteo-viridi, densissimè radiatâ; dentibus cardinalibus parvis, lamellatis; lateralibus parvis rectisque; margaritâ albâ et iridescente.

Shell oblong, much compressed, inequilateral; valves rather thin; beaks slightly prominent, compressed, undulated at the beaks; epidermis yellowish-green, closely radiated; cardinal teeth small, lamellar; lateral teeth small and straight; nacre white and iridescent.

Hab. Abbeville District, S. C. Dr. Barratt and Mr. Tuomey.

My cabinet and cabinets of Dr. Barratt and Mr. Tuomey.

Diam. .8, Length 1.4, Breadth 2.3 inches.

Shell oblong, much compressed; posterior dorsal margin carinate; substance of the shell rather thin, slightly thickened before; beaks slightly prominent, compressed and crowded with double concentric undulations; ligament very small, thin, nearly concealed within the valves; epidermis yellowish-green, with numerous capillary rays over nearly the whole disk; cardinal teeth rather small, lamellar, single in the right and double in the left valve; lateral teeth rather short, straight and acicular; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the point of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks small and angular; nacre white, rather brilliant and iridescent.

Remarks.—I owe to the kindness of Dr. Barratt and Mr. Tuomey four specimens of this interesting species, which draws more attention from the fact of its forming a natural link with a highly interesting species which I described and figured in Vol. III., Trans. Am. Phil. Soc., Pl. XII. Fig. 22, under the name of *Symphynota (Unio) compressa*, afterwards changed to *pressus*. It differs from the *pressus*, however, in being less oblong, in being rather more inflated and less lenticular. In the teeth, while there is a strong assimilation to that peculiar character of the *pressus*, there is a marked difference; the elevation of the posterior portion of the cardinal tooth being very much less, and the two bifid portions much closed. The umbonial slope is disposed to be angular. The transverse striæ are close. The marks of growth distant. This species, like *U. pressus*, has the symphynote character of the wing.

UNIO RUFUSCULUS. Pl. XIV. Fig. 7.

Testâ lævi, ellipticâ, subcompressâ, inæquilaterali, posticè biangulatâ; valvulis subcrassibus; natibus subprominentibus; epidermide tenebroso-fuscâ, striatâ; dentibus cardinalibus obliquis, parvis striatisque; laterali-bus remotis, longis, lamellatis, rectis; margaritâ vel albâ vel salmonis colore tinctâ.

Shell smooth, elliptical, rather compressed, inequilateral, biangular behind; valves rather thick; beaks somewhat prominent; epidermis dark-brown, striate; cardinal teeth oblique, small and striate; lateral teeth remote, long, lamellar and straight; nacre white or salmon coloured.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet.

Diam. .9,

Length 1.4,

Breadth 2.4 inches.

Shell smooth, elliptical, rather compressed, inequilateral, biangular behind, rounded before, substance of the shell rather thick, thicker before; beaks somewhat prominent and submedial; ligament rather long and thick; epidermis dark-brown, obscurely rayed on the posterior slope, striate towards the margin, with obscure, nearly equidistant marks of growth; umbonal slope subangular; cardinal teeth oblique, small, with regular striæ; single in the right and double in the left valve; lateral teeth separated from the cardinal tooth, long, lamellar, straight, and slightly thickened towards the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed rather above the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks very small; nacre white or salmon coloured.

Remarks.—This species belongs to the group of which the common *U. complanatus* is the type. It seems to stand between it and *U. Congaræus*, (Nobis.) It is more angular on the umbonal slope than *complanatus*, and less so than *Congaræus*. Of the three specimens received, two are salmon coloured. The oldest specimen is very thick and much eroded. The youngest is rather thin. The outline of this species is very much like the figure of *Unio planilateris*, Conrad, but it differs in the colour of the epidermis, in the thickness of the teeth, and the obliqueness of the umbonal slope. It is also very like *U. fulvus*, (Nobis,) which also came from South Carolina; and it is possible that when good suites are brought together, this species may prove to be only the adult of a flatter variety of *fulvus*.

UNIO WHITEIANUS. Pl. XIV. Fig. 8.

Testâ lævi, ellipticâ, inflatâ, valdè inæquilaterali, posticè subangulatâ; valvulis crassis; natibus subprominentibus; epidermide vel tenebroso-fuscâ vel nigrâ, striatâ, ad apices politâ; dentibus cardinalibus magnis, elevatis, crenulatis; laterali-bus longis subcurvisque; margaritâ vel albâ vel salmonis colore tinctâ.

Shell smooth, elliptical, inflated, very inequilateral, subangular behind; valves thick; beaks somewhat prominent; epidermis dark-brown or black, striate, towards the beaks polished; cardinal teeth large, elevated, crenulated; lateral teeth long and somewhat curved; nacre white or salmon coloured.

Hab. near Savannah, Geo. Rev. G. White.

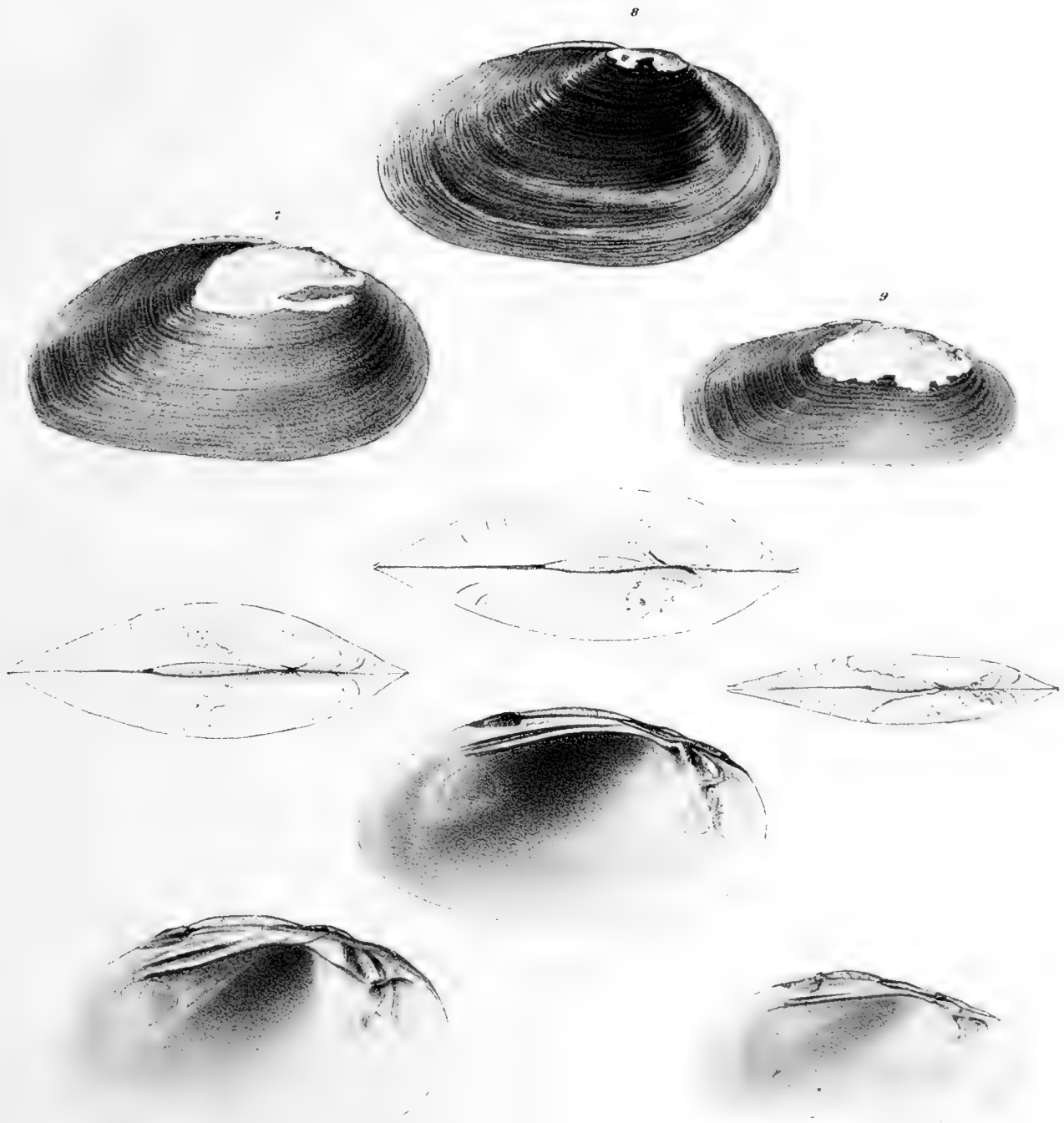
My cabinet and cabinet of Mr. White.

Diam. .1,

Length 1.4,

Breadth 2.5 inches.

Shell smooth, elliptical, inflated, very inequilateral, rounded before, subangular behind; substance of the shell thick; beaks somewhat prominent; placed towards the anterior



From Nature by DeKay

7 *Unio xolusculus*
 8. . *Whitmanus*.
 9 . *Lazarus*.

Emulatione Zuck

margin; ligament short and thick; epidermis dark-brown or black, roughly striate on the margin, but smooth and highly polished on the sides and towards the beaks; marks of growth rather indistinct and distant; umbonial slope rounded; cardinal teeth large, elevated, crenulated, pointed, single in the right and double in the left valve; lateral teeth long, rather thick, somewhat curved and separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks shallow and rounded; nacre usually salmon coloured, sometimes white.

Remarks.—Many of this species were sent to me by Mr. White. None of the beaks are sufficiently perfect to detect the undulations of the tips. The form and size of this species approaches closely to *U. confertus* and *U. Geddingsianus*, (Nobis.) It may be distinguished from them, however, by the remarkable polish of the superior portion of the disk and the beaks, and by the rough striæ of the other portion of the epidermis. The adult specimens are all very dark-brown or black. The younger shells are yellowish, with numerous dark-green rays over nearly the whole disk. Some of the adult specimens are quite straight on the basal margin, and almost falcate.

UNIO LAZARUS. Pl. XIV. Fig. 9.

Testâ lævi, arcuatâ, valdè transversâ, compressâ, valdè inæquilaterali, posticè subbiangulatâ; valvulis per-tenuibus; natibus undulatis, vix prominentibus; epidermide tenebroso-fuscâ, rugoso-striatâ; dentibus cardinalibus minimis; lateralibus longis, acicularis, remotis rectisque; margaritâ vel albâ vel purpureâ et valdè iridescente.

Shell smooth, arcuate, very wide, compressed, very inequilateral; subbiangular behind; valves very thin; beaks undulated, scarcely prominent; epidermis dark-brown, roughly striate; cardinal teeth very small; lateral teeth long, acicular, remote and straight; nacre white or purple and very iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. .4,

Length .9,

Breadth 2 inches.

Shell smooth, emarginate at base, very wide, compressed, very inequilateral, behind subbiangular, before rounded; posterior slope wide and flattened; substance of the shell very thin, thicker before; beaks placed near to the anterior margin, furnished with very minute undulations at the tip, scarcely prominent and very small; ligament long and thin; epidermis dark-brown, roughly striate, with obscure marks of growth; umbonial slope biangular; cardinal teeth very small, crenulate, double in the left and single in the right valve; lateral teeth long, separated from the cardinal tooth, acicular, straight and slightly turned up at the extreme posterior point; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices small and placed under the plate posterior to the cardinal tooth; cavity of the shell very shallow; cavity of the beaks very shallow and rounded; nacre white or purple.

Remarks.—This is a small, very thin and fragile species. The young have very much the appearance of the young of the elongate variety of *U. complanatus*, but the adult and middle aged are arcuate, and cannot be mistaken for that species. The young are

greenish, with obscure rays, and the undulations of the beaks are less pronounced than those of the *complanatus*. It is somewhat like *U. folliculatus*, (Nobis,) but is a thinner and less transverse species. The older specimens are very much compressed in the middle, near to the basal margin.

UNIO MERUS. Pl. XV. Fig. 10.

Testâ lævi, ellipticâ, subinflatâ; valvulis crassis; natibus subprominentibus, ad apices undulatis; epidermide luteâ, radiatâ, nitidâ; dentibus cardinalibus magnis, crenulatis; lateralibus longis, rectis, à cardinalibus separatis; margaritâ albâ et iridescente.

Shell smooth, elliptical, somewhat inflated; valves thick; beaks somewhat prominent, undulated at the beaks; epidermis yellow, radiated, shining; cardinal teeth large, crenulate; lateral teeth long, straight and separated from the cardinal tooth; nacre white and iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. .6,

Length 1,

Breadth 1.5 inches.

Shell smooth, elliptical, rather inflated, somewhat striate, rounded before and angular behind; substance of the shell thick, thinner behind; beaks somewhat prominent, rather coarsely undulated at the tip; ligament short and rather thick; epidermis yellow, obscurely radiated, shining; umbonial slope subangular; marks of growth distant and distinct; cardinal teeth large, compressed, crenulate, pointed, single in the right and double in the left valve; lateral teeth long, straight, lamellar, separated from the cardinal tooth; anterior cicatrices approximate; posterior cicatrices confluent; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the shell shallow; cavity of the beaks small and angular; nacre white and iridescent.

Remarks.—In its general character, this species resembles *U. Congaræus*, (Nobis.) It is not, however, so much compressed, and the angle of the umbonial slope is much less expressed. Of the six specimens before me, five have white nacre. The sixth and largest is slightly tinted with salmon colour.

UNIO CONCAVUS. Pl. XV. Fig. 11.

Testâ lævi, ellipticâ, inflatâ; valvulis subtenuibus; natibus prominulis; epidermide pallido-luteolâ, virido-striatâ; dentibus cardinalibus parvis, compressis; lateralibus longis rectisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, inflated; valves rather thin; beaks slightly prominent; epidermis pale-yellow, with green rays; cardinal teeth small and compressed; lateral teeth long and straight; nacre white and iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

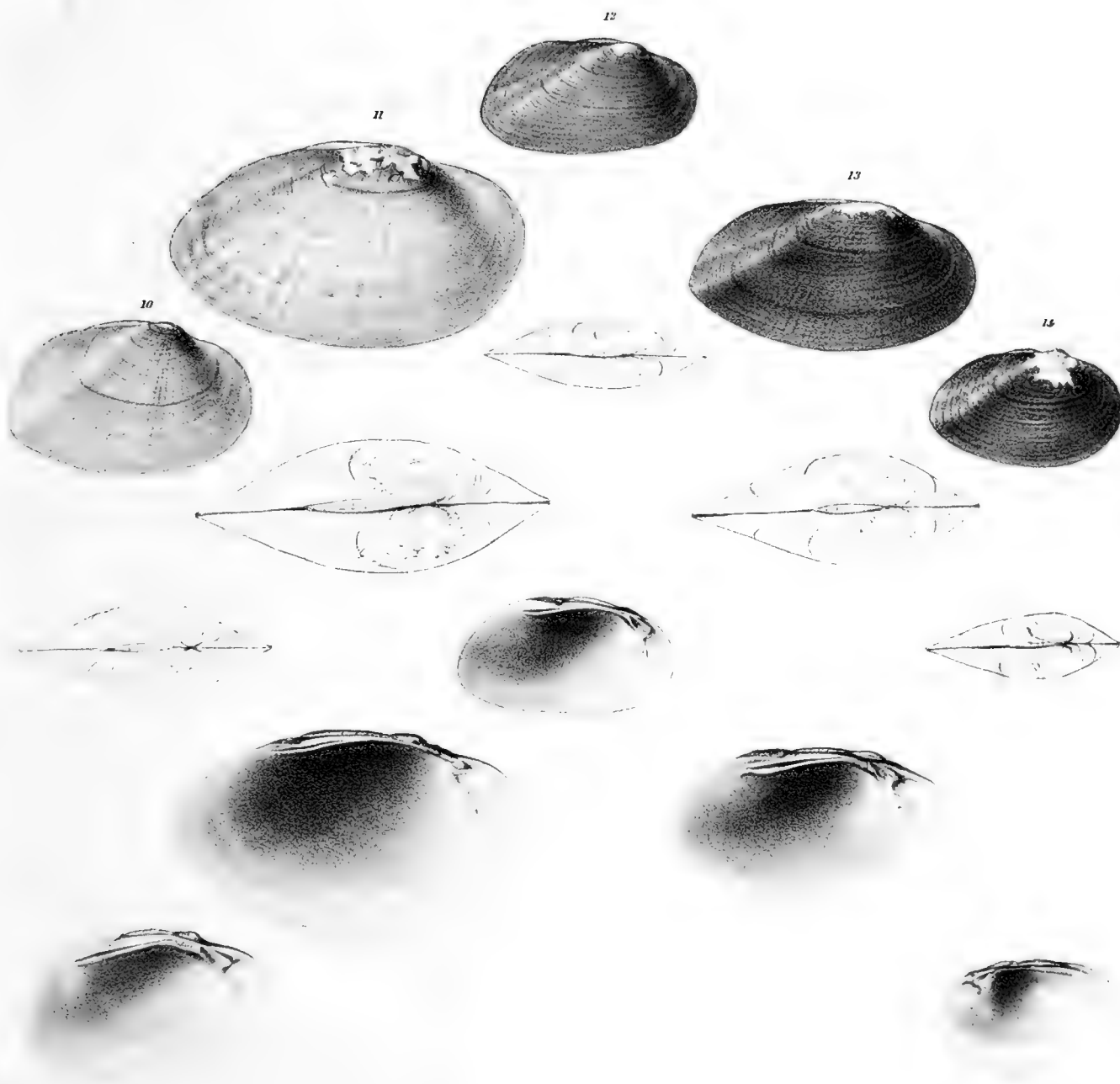
My cabinet.

Diam. .8,

Length 1.2,

Breadth 2.2 inches.

Shell smooth, elliptical, inflated, rounded before and subangular behind; substance of the shell rather thin, slightly thickened before; beaks slightly prominent, nearly medial; ligament rather long and thin; epidermis pale-yellow, with numerous green rays reaching to the margin, smooth and polished, scarcely showing the lines of growth; cardinal teeth compressed, single in both valves, and abruptly terminated; lateral teeth long, straight,



10, *Unio merus*.
 11, " *concavus*.
 12, " *ineptus*.
 13, " *buxeus*.
 14, " *pygmaeus*.

From Nature by Johnson

January 1881

and slightly elevated; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks shallow and subangular; nacre white and iridescent.

Remarks.—A single adult specimen only has been received from Dr. Barratt, with two quite young ones. The beaks of one of these are sufficiently perfect to show that the undulations extend some distance from the point, and that they are rather complex. The young are rayed over the whole disk. The adult specimen has many dark-green rays over the posterior portion, but none on the anterior portion. This species is somewhat like *Unio cariosus*, Say, but is more regularly elliptical and more transverse. The young specimens very much resemble the young of *U. radiatus*.

UNIO INEPTUS. Pl. XV. Fig. 12.

Testâ lævi, ellipticâ, subcompressâ; valvulis tenuibus; natibus vix prominentibus, ad apices undulatis; epidermide valdè tenebrôsâ, striatâ; dentibus cardinalibus parvis, compressis; lateralibus longis, subrectis, à cardinalibus separatis; margaritâ cæruleâ.

Shell smooth, elliptical, somewhat compressed; valves thin; beaks scarcely prominent, undulated at the beaks; epidermis very dark and striated; cardinal teeth small, compressed; lateral teeth long, nearly straight and separated from the cardinal tooth; nacre bluish.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet.

Diam. .4,

Length .7,

Breadth 1.3 inches.

Shell smooth, elliptical, somewhat compressed, rounded before and subangular behind; substance of the shell thin; beaks small, scarcely prominent; undulated rather coarsely at the tip; ligament short and thin; epidermis much striated, very dark-brown, nearly black; umbonal slope rounded; marks of growth indistinct; cardinal teeth small, compressed, crenulate, double in the left and single in the right valve; lateral teeth long, nearly straight, thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell very shallow; cavity of the beaks very shallow and angular; nacre bluish.

Remarks.—A single specimen only of this species is before me, and may not be adult. It is quite small, and somewhat like *U. fabalis*, (Nobis,) of our western rivers, but is still more closely allied, in general form and colour, to *U. faba*, D'Orb. It differs from the former in being a thin shell, and having a more elevated posterior slope, and from the latter in having the sides more compressed, and in the beaks having irregular undulations, while the *faba* has the radiated folds so peculiar to most of the South American species. The specimen of *ineptus* before me has two obscure rays on the posterior slope, none being apparent over the disk. More perfect specimens may present rays.

UNIO BUXEUS. Pl. XV. Fig. 13.

Testâ lævi, ellipticâ, subinflatâ; valvulis subcrassis; natibus subprominentibus; epidermide tenebroso-fusâ; dentibus cardinalibus subparvis erectisque; lateralibus longis subrectisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, rather inflated; valves somewhat thick; beaks somewhat prominent; epidermis dark-brown; cardinal teeth rather small and erect; lateral teeth long and nearly straight; nacre white and iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. .7,

Length 1,

Breadth 1.7 inches.

Shell smooth, elliptical, rather inflated, rounded before and angular behind; substance of the shell rather thick, thinner behind; beaks somewhat prominent, submedial; ligament rather short and thin; epidermis dark-brown, with obscure rays, very smooth and polished; marks of growth distant, regular and well marked; cardinal teeth rather small, compressed, double in the left and single in the right valve; lateral teeth long, nearly straight and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the under side of the cardinal tooth; cavity of the shell rather shallow; cavity of the beaks shallow and angular; nacre white and iridescent.

Remarks.—Dr. Barratt sent me three specimens of this species, one only being adult. Neither of them have the beaks sufficiently perfect to show any undulations. In outline it resembles *U. concavus*, (Nobis,) but it is more compressed, and differs much in the colour of the epidermis and the rays. The adult specimen is slightly salmon coloured in the cavity of the beaks. One of the younger specimens is distinctly salmon coloured.

UNIO PYGMÆUS. Pl. XV. Fig. 14.

Testâ lævi, ellipticâ, subcompressâ, striatâ; valvulis subtenuibus; natibus subprominentibus; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis; lateralibus linearis subcurvisque; margaritâ cæruleâ et iridescente.

Shell smooth, elliptical, rather compressed, striate; valves rather thin; beaks somewhat prominent; epidermis dark-brown; cardinal teeth small; lateral teeth linear and slightly curved; nacre bluish and iridescent.

Hab. Abbeville District, S. C. J. P. Barratt, M. D.

My cabinet.

Diam. .4,

Length .7,

Breadth 1.2 inches.

Shell smooth, elliptical, rather compressed, striate, rounded before and angular behind; substance of the shell rather thin, thicker before; beaks somewhat prominent; ligament short and thin; epidermis dark-brown, striate, with obscure rays, and slightly polished; umbonal slope angular; marks of growth indistinct; cardinal teeth small, compressed; lateral teeth rather long, linear, slightly curved, and thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks small and angular; nacre blue and very iridescent behind.

Remarks.—This is a very small species, and a single valve only, (the right) has been received by me. I do not think this is quite adult. The beak is not sufficiently perfect to observe any undulations. This shell is about the size of *U. fabalis*, (Nobis,) and *parvus*, Barnes, but cannot be confounded with either of them. It is a thinner shell than the former and less inflated than the latter.

UNIO FRATERNUS. Pl. XVI. Fig. 15.

Testá lævi, ellipticá, compressá, striatá, valdè inequilaterali, posticè subbiangulari; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscá; dentibus cardinalibus parvis, tuberculatis, striatis; lateralibus prælongis subcurvisque; margaritá vel albá vel purpureá et iridescente.

Shell smooth, elliptical, compressed, striate, very inequilateral, subbiangular behind; valves rather thick; beaks somewhat prominent; epidermis dark-brown; cardinal teeth small, tuberculate, striate; lateral teeth very long and somewhat curved; nacre white or purple and iridescent.

Hab. Columbus, Georgia, Dr. Boykin; Abbeville District, S. C., J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. .6, Length 1.3, Breadth 1.4 inches.

Shell smooth, elliptical, compressed, striate, very inequilateral, subbiangular behind, obtusely rounded before, flattened on the sides; substance of the shell somewhat thick, thinner behind; beaks somewhat prominent and placed near to the anterior margin; ligament long and rather thick; epidermis very dark-brown, darker on the posterior slope, with distant marks of growth; posterior slope compressed, with fold-like wrinkles, and raised into a carina; umbonial slope obtusely angular; cardinal teeth small, tuberculate and striate; lateral teeth very long, somewhat curved, thicker at the posterior end and separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in a row on the interior of the plate; pallear cicatrix impressed; cavity of the shell very shallow; cavity of the beaks very shallow and rounded; nacre white or purple and iridescent.

Remarks.—This species belongs to the group of which *U. complanatus* is the type. It is closely allied to *U. Hopetonensis*, (Nobis,) but differs in being more elliptical in the outline, and having a less elevated carina, and in the cardinal teeth, which are not compressed. The outline is more that of *Unio Hembeli*, Con., but it is not so thick a shell, and does not possess the coarse folds on the posterior slope, which in that species distinguish it so well. The *Hembeli* is also darker, the striæ coarser, and the umbonial slope more rounded. Of the six specimens before me, two are white, three purple, and one slightly salmon coloured. The margin is broad and dark coloured.

UNIO CUVIERIANUS. Pl. XVI. Fig. 16.

Testá lævi, ellipticá, convexá, inequilaterali, posticè obtusè angulatá; valvulis crassis; natibus prominulis; epidermide nitidá, castaneo-fuscá; dentibus cardinalibus magnis crenulatisque; lateralibus prælongis subcurvisque; margaritá argenteá.

Shell smooth, elliptical, convex, inequilateral, obtusely angular behind; valves thick; beaks a little prominent; epidermis shining, chestnut-brown; cardinal teeth large, crenulate; lateral teeth very long and somewhat curved; nacre silvery white.

Hab. Washington county, Georgia, Rev. G. White.

Cabinet of Major Le Conte.

Diam. 1.5, Length 2.2, Breadth 3.9 inches.

Shell smooth, elliptical, convex, inequilateral, obtusely angular behind, inflated over the umbones; substance of the shell very thick; beaks but slightly prominent and submedial;

ligament not very long and moderately thick; epidermis chestnut-brown, with very distant marks of growth; posterior slope wide, rather flattened, with two raised lines passing from the beaks to the posterior margin; umbonial slope large and rounded; cardinal teeth large, crenulate, double in the left and single in the right valve; lateral teeth very long, somewhat curved and thickened towards the posterior end, separated from the cardinal tooth; anterior cicatrices large and distinct; posterior cicatrices large and distinct; dorsal cicatrices small, and placed nearly in the centre of the beaks; pallear cicatrix deeply impressed; cavity of the shell wide, not very deep; cavity of the beaks exceedingly small and rounded; nacre silvery white.

Remarks.—A single specimen only of this fine shell has come under my notice, and it belongs to the cabinet of my friend Major Le Conte. It is a member of that great group of which *U. complanatus* is the type, but it differs from that species somewhat in outline, in being inflated over the umbonial slope, and in having a smoother epidermis.

I dedicate this fine species to the memory of the great zoologist, Baron Cuvier.

UNIO FORBESIANUS. Pl. XVI. Fig. 17.

Testâ lævi, triangulari, subcompressâ, inequilaterali, posticè angulatâ; valvulis subcrassis; natibus subprominentibus, ad apices undulatâ; epidermide castaneo-fuscâ; dentibus cardinalibus acuminatis, subgrandibus; lateralibus longis subrectisque; margaritâ vel albâ vel purpureâ et iridescente.

Shell smooth, triangular, rather compressed, inequilateral, angular behind, valves rather thick; beaks rather prominent, undulated at the tip; epidermis chestnut-brown; cardinal teeth rather large and pointed; lateral teeth large and nearly straight; nacre white or purple and iridescent.

Hab. Savannah River. Major Le Conte.

My cabinet and cabinet of Major Le Conte.

Diam. .8,

Length 1.2,

Breadth 1.8 inches.

Shell smooth, triangular, rather compressed, inequilateral, acutely angular behind, slightly flattened before the umbonial slope; substance of the shell rather thick, thinner behind; beaks rather prominent and rather coarsely undulated at the tip; ligament rather short and moderately thick; epidermis chestnut-brown, lines of growth distant and distinct, sometimes rayed; umbonial slope raised into rather an acute angle; posterior slope flattened and furnished with numerous angular crumpled folds; cardinal teeth rather large, pointed and crenulate; lateral teeth long and nearly straight; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed on the under side of the cardinal teeth; cavity of the shell rather small and rounded; cavity of the beaks shallow and angular; nacre white or purple and iridescent.

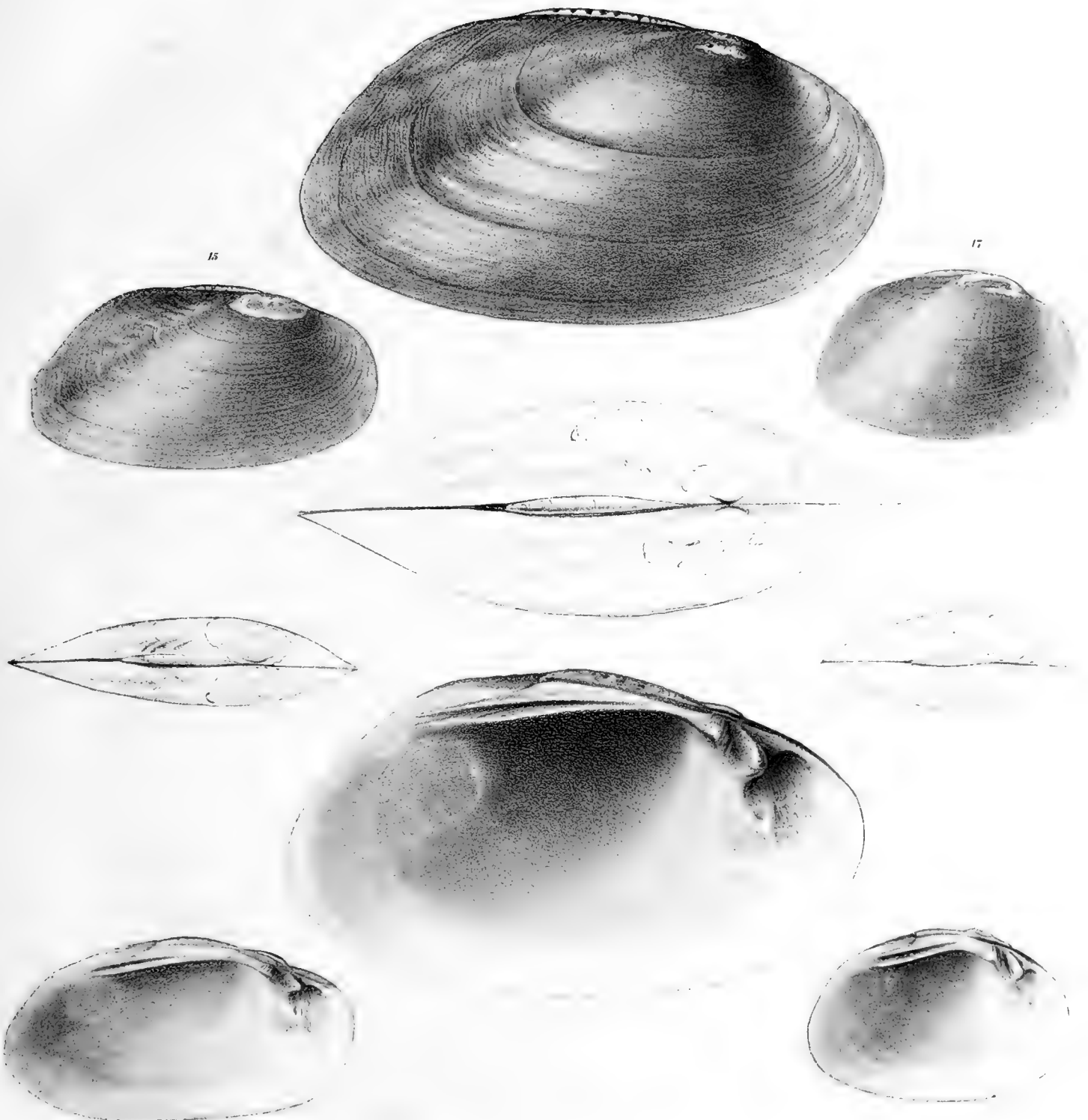
Remarks.—Several of these of different ages, were given to me by my friend Major Le Conte, to whom I owe the possession of so many new species. It is allied to *U. incrasatus*, (Nobis,) but is not so transverse. In the young, the epidermis is rather polished, and some of them have greenish rays over the middle of the disk. The smallest of them all is purple in the nacre and beautifully iridescent. Some of the specimens seem to be devoid of rays altogether.

Named in honour of Professor E. Forbes, of King's College, London.

16

17

15



15 *Unio fraternus*.
 16 " *caryocanus*.
 17 " *rochesianus*.

UNIO KLEINIANUS. Pl. XVII. Fig. 18.

Testa plicatâ, triangulari, compressâ, ad latere planulatâ, inæquilaterali, posticè obtusè angulatâ; valvulis subcrassis; natibus subprominentibus; epidermide tenebroso-fuscâ; dentibus cardinalibus crassis crenulatisque; lateralibus brevibus rectisque; margaritâ albâ et iridescente.

Shell plicate, triangular, compressed, flattened on the side, inequilateral, obtusely angular behind; valves rather thick; beaks somewhat prominent; epidermis dark-brown; cardinal teeth thick and crenulate; lateral teeth short and straight; nacre white and iridescent.

Hab. Suwanee river, Florida. Major Le Conte.

My cabinet and cabinet of Major Le Conte.

Diam. .8,

Length 1.2,

Breadth 1.6 inches.

Shell plicate, triangular, compressed, flattened at the side, inequilateral, obtusely angular behind, enlarged over the umbonial slope; substance of the shell rather thick, thinner behind; beaks somewhat prominent; epidermis dark-brown, with marks of growth rather distant; ligament short and thick; folds irregular, small and extending nearly over the whole disk, on the posterior slope more regular and nearly parallel; posterior slope large, and raised into a carina, umbonial slope obtusely angular; cardinal teeth thick, large, crenulate and double in both valves; lateral teeth short and straight, separated from the cardinal tooth by a rather large plate; anterior cicatrices distinct; posterior cicatrices distinct; pallial cicatrix well impressed; cavity of the shell rather deep and rounded; cavity of the beak deep and acutely angular; nacre white and iridescent.

Remarks.—A new plicate species is rather a rare acquisition, and I believe this is the first from Florida. Major Le Conte, I believe, procured but two specimens, both of which are before me. In outline and size it is allied to *U. infucatus*, Con., which, however, is not figured as a folded shell by him. It differs, however, in having larger folds, which are more interrupted, and in the colour of the epidermis, which, in *infucatus*, when old, is almost, if not quite, black. The folds in *Kleinianus* are very irregular, and so much broken up as to have the appearance, on part of the disk, of being nodules. The beaks, unfortunately, of the two specimens are much eroded, and their characters, therefore, not known. I should suppose that, in perfect or young specimens, the folds would extend to the apex, and present a fine appearance.

This interesting species I dedicate to Klein, the author of *Testamen Methodi*, 1773, who was in advance of most of the conchologists of his day.

UNIO SATUR. Pl. XVII. Fig. 19.

Testa lævi, triangulari, valdè inflatâ, inæquilaterali, posticè truncatâ; valvulis crassis; natibus maximis, inflatis, rotundatis; epidermide tenebroso-fuscâ, politâ; dentibus cardinalibus magnis, compressis, obliquis, acuminatis; crenulatis; lateralibus longis, lamellatis subcurvisque; margaritâ albâ et iridescente.

Shell smooth, triangular, very much inflated, inequilateral, truncate behind; valves thick; beaks large, inflated and rounded; epidermis dark-brown, polished; cardinal teeth large, compressed, oblique, acuminate, crenulate; lateral teeth long, lamellar and curved; nacre white and iridescent.

Hab. Alexandria, Louisiana, J. Hale, M. D. Lake Calcashue, near New Orleans, Mr. Anthony.

My cabinet and cabinets of Dr. Hale and Mr. Anthony.

Diam. 2.1,

Length 2.5,

Breadth 3 inches.

Shell smooth, triangular, very much inflated, inequilateral, truncate behind; substance of the shell thick, beaks large, inflated, rounded and placed towards the anterior margin; ligament short and very thick; epidermis dark-brown, polished, striate, in the young nearly olive; lines of growth very distant; posterior slope flattened, with an obscure, impressed, rather wide groove from the beaks to the margin; umbonial slope angular towards the beaks and inflated; cardinal teeth large, compressed, oblique, acuminate and crenulate; lateral teeth long, lamellar, curved, enlarged at the posterior end and separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent, dorsal cicatrices placed on the under side and near the edge of the plate; pallear cicatrices not deeply impressed; cavity of the shell very deep and rounded; cavity of the beaks very deep and rounded; nacre white and iridescent.

Remarks.—Several specimens of this species have been in my possession for some years. It belongs to the group of which *U. ovatus*, Say, may be considered the type. It is more like *U. occidentalis*, (Nobis,) than *ovatus*, having the umbonial slope rounded. It differs, however, from the latter species in having a more inflated disk, and in being darker and rounder. It is not so inflated as *capax*, Green, but much like it. All the five individuals before me are females, unless the youngest one. The truncation of the posterior margin is very remarkable. In the oldest specimen, that portion of the disk is so turned in, as to present nearly a flat surface. The beaks are very much inflated and drawn back.

UNIO LAMARCKIANUS. Pl. XVII. Fig. 20.

Testa nodulosâ, subrotundâ, compressâ, in medio planulatâ, subequilaterali, posticè subangulatâ, punctiunculus passim radiatâ; valvulis crassis; natibus prominentibus, compressis, ad apices undulatis; epidermide luteâ, virido-radiatâ; radiis numerosis interruptis; dentibus cardinalibus magnis, compressis; lateralibus brevibus crassisque; margaritâ argenteâ.

Shell nodulose, subrotund, compressed, flattened in the middle, nearly equilateral, obtusely angular behind, with dotted rays over the whole disk; valves thick; beaks prominent, compressed, and angular at the point; epidermis yellow, with green rays; rays numerous and interrupted; cardinal teeth large, compressed; lateral teeth short and thick; nacre silvery white.

Hab. Caddo river, Arkansas, Professor Powell. Washitta river, near the Hot Springs, Arkansas, Dr. Hale.

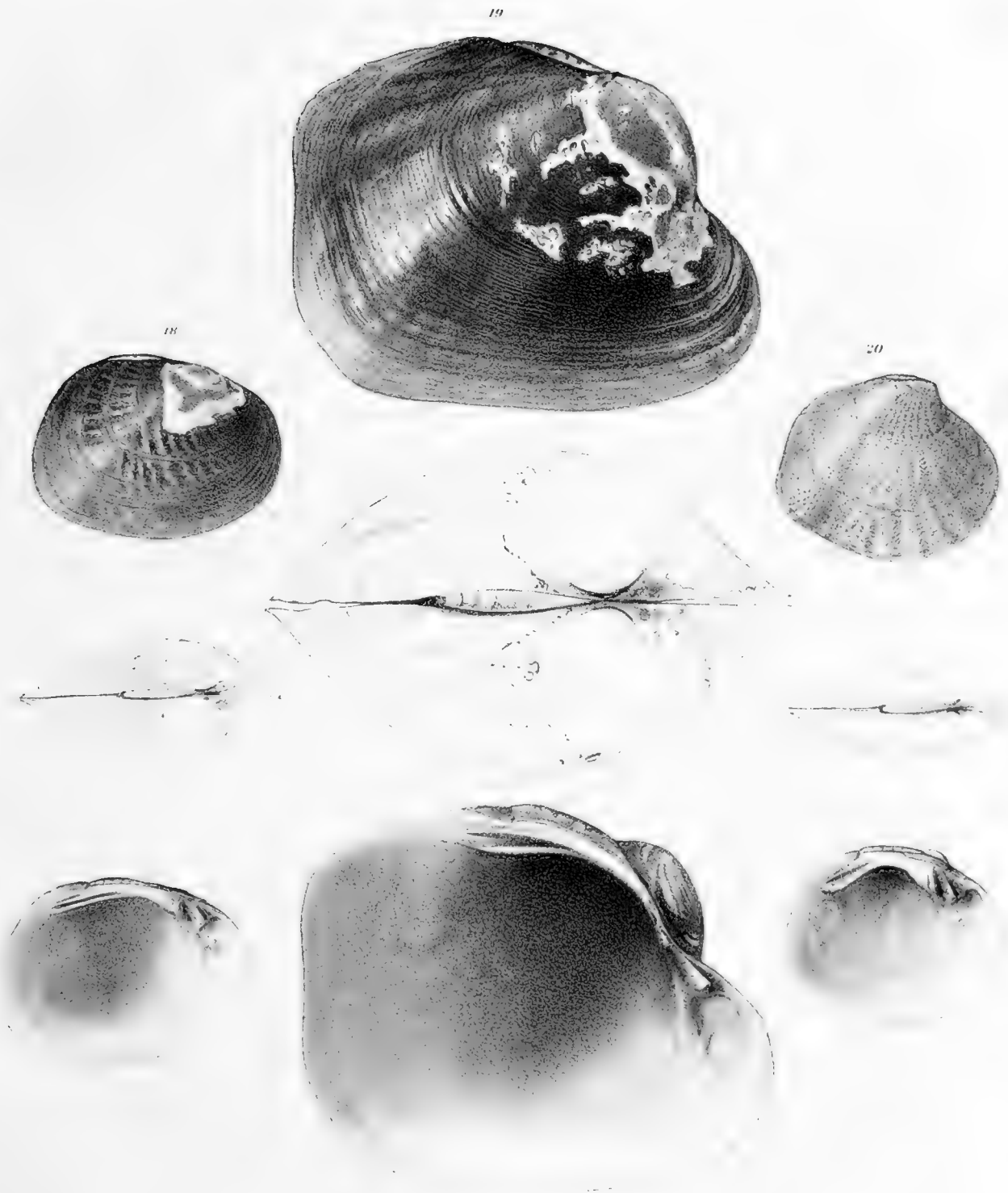
My cabinet and cabinets of Prof. Powell and Mr. Shaeffer.

Diam. .5,

Length 1.1,

Breadth 1.4 inches.

Shell nodulous, subrotund, compressed, flattened from the beak to the basal margin, nearly equilateral, obtusely angular behind, with dotted rays over the whole disk; substance of the shell thinner behind; beaks prominent, compressed and angular at the point; ligament very short and thick; epidermis yellow, with green rays over the whole disk, on the anterior part furnished with a few larger rays; lines of growth distant; rays numerous, interrupted, dotted and chain-like; umbonial slope raised into an obtusely angular ridge from the beaks to the posterior basal margin; cardinal teeth large, compressed, crenulate; lateral teeth short, thick and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices distinct, dorsal cicatrices small and placed on the under side



18 *Ulio Kleinianus*.
 19 " *saliv.*
 20 " *Lamarekianus*.

of the cardinal tooth; pallear cicatrices impressed; cavity of the shell very shallow; cavity of the beaks rather deep and angular; nacre silvery white.

Remarks.—The curious and beautiful interrupted rays which cover the whole disk of this species, bring it into the group of which the *U. irroratus*, (Nobis,) was the first described, and may be considered the type. There are now four known, all of which, while easily distinguished, have very much the same general characteristics,—*irroratus*, *dromas*, *caperatus* and *Lamarckianus*. The five specimens before me are of different sizes. The largest is the most perfect one, and is that which is figured. It is about the size of a young *dromas*, when about to finish its two humps. It differs from all the other three species, in having an angular ridge from the beaks to the posterior basal margin. The beaks are remarkably compressed and pointed, like *securis*, (Nobis.) The nodules are little more than rugosities, disposed to run into small folds. Both this and *caperatus* might be said scarcely to belong to the nodulous division of the genus, but they are certainly not devoid of nodules, though they are small and irregular. The lines of growth are very different from *caperatus*. In the latter they are very close. In outline, the *Lamarckianus* is nearly the same with *intermedius*, Con., from Tennessee. It cannot, however, be confounded with that species, as it has not the furrow which that shell has on the posterior slope; nor has it the well expressed verrucose character of it. It differs also in the rays, which in *intermedius* are arrow-head shaped. Indeed the *intermedius* belongs to another group, of which *metaneve*, Raf., may be considered the type.

I dedicate this beautiful species to the memory of the great naturalist Lamarck.

UNIO HEBES. Pl. XVIII. Fig. 21.

Testâ lævi, oblongâ, subcompressâ, ad laterè planulatâ, inæquilaterali, posticè truncatâ; valvulis subcrassis; natibus subprominentibus, ad apices undulatis; epidermide striatâ tenebroso-fuscâ, eradiatâ; dentibus cardinalibus subcrassis, compressis, obliquis, acuminatis; lateralibus longis curvisque; margaritâ albâ.

Shell smooth, oblong, rather compressed, flattened on the side, inequilateral, truncate behind; valves rather thick; beaks somewhat prominent, undulate at the tip; epidermis striate, dark-brown, rayless; cardinal teeth rather thick, compressed, oblique, acuminate; lateral teeth long and curved; nacre white.

Hab. Oconee river, near Athens, Georgia. Major Le Conte.

My cabinet and cabinet of Major Le Conte.

Diam. .8, Length 1.3, Breadth 2.2 inches.

Shell smooth, oblong, rather compressed, flattened on the side, inequilateral, truncate behind, rounded before; substance of the shell rather thick, beaks somewhat prominent, undulated at the tip and submedial; ligament rather long, thin and nearly covered; epidermis dark brown, without rays, thickly striate over the lower half of the shell, thick and smooth above; lines of growth not well defined; posterior slope compressed into an elevated carina, with a slightly impressed furrow, which has two very obscure raised lines; umbonal slope rounded; cardinal teeth rather thick, compressed, oblique, acuminate, crenulate and double in both valves; lateral teeth long, curved and thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks shallow and obtusely angular; nacre white.

Remarks.—Among the many shells from Georgia which I owe to the kindness of Major Le Conte, was a single specimen of this species. It is allied to *U. Lecontianus*, (Nobis,) and is like it in outline; but it is more compressed, higher in the carina, and much more striate and rough on the exterior; it is also a thinner shell. The posterior margin of this specimen is also slightly emarginate. The tips of the beaks are not perfect, but they are enough so in this specimen, to show that the undulations are more numerous than usual and very beautiful. The upper portion of the double lateral tooth is very small in this specimen.

UNIO MOUSSONIANUS. Pl. XVIII. Fig. 22.

Testâ lævi, ellipticâ, subconvexâ, subinequilaterali, posticè angulatâ; valvulis percrassis; natibus prominentibus, crassis; epidermide castaneo-fuscâ; dentibus cardinalibus magnis, subcompressis; lateralibus longis, crassis subcurvatus; margaritâ argenteâ et iridescente.

Shell smooth, elliptical, subconvex, subinequilateral, angular before; valves very thick; beaks prominent and thick; epidermis chestnut-brown; cardinal teeth large, rather compressed; lateral teeth long, thick, somewhat curved; nacre silvery white and iridescent.

Hab. Georgia, J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. 1.1,

Length 1.8,

Breadth 2.8 inches.

Shell smooth, elliptical, subconvex, somewhat inequilateral, angular behind and rounded before; substance of the shell very thick, rather thinner behind; beaks prominent and thick; ligament rather long and thick; epidermis chestnut-brown, marks of growth distant and rather distinct; umbonial slope obtusely angular; cardinal teeth large, rather compressed, double in the left and single in the right valve; lateral teeth long, thick, laminate, thickened towards the posterior end and slightly arched; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed on the under side of the plate, near to the edge; pallial cicatrix impressed; cavity of the shell not very deep; cavity of the beaks rather shallow and angular; nacre silvery white and iridescent.

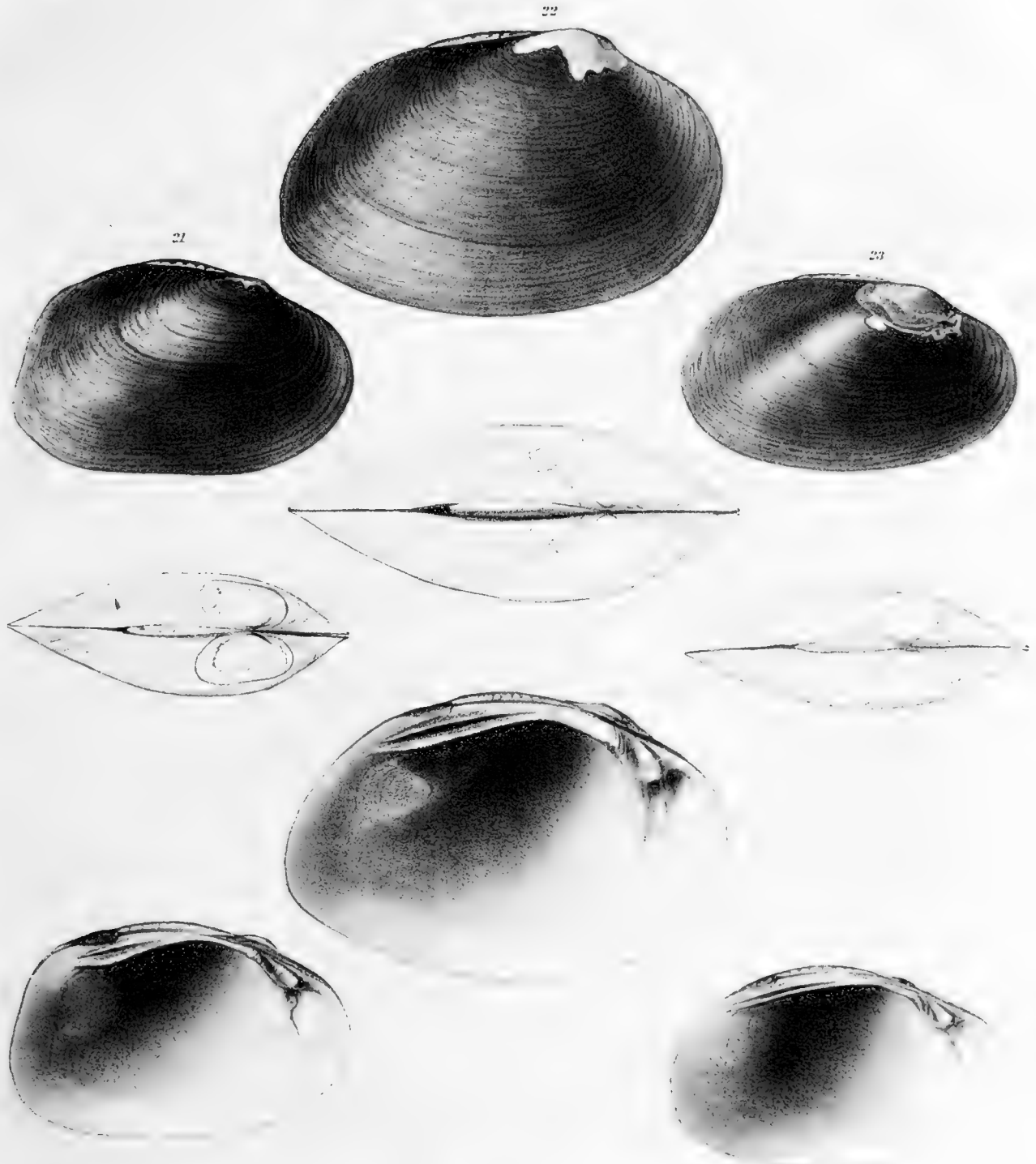
Remarks.—The outline and general appearance of this species reminds one of *U. delodontus*, Lam. It is, however, a thicker shell and has thicker teeth. But three specimens were received by me. One of them is slightly tinged with salmon colour in the cavity of the beaks, and others may be found very likely more deeply coloured.

I dedicate this species to Prof. A. Mousson, of Zurich, the author of "The Land and Fresh Water Shells of Java."

UNIO NIGERRIMUS. Pl. XVIII. Fig. 23.

Testâ lævi, ellipticâ, subconvexâ, inæquilaterali, posticè subrotundatâ; valvulis subtenuibus; natibus parvis, prominulis, ad apices undulatis; epidermide nigrâ, nitidâ, striatâ; dentibus cardinalibus subcompressis, obliquis, acuminatis, crenulatis; lateralibus longis, lamellatis subcurvisque; margaritâ albâ et valdè iridescente.

Shell smooth, elliptical, rather convex, inequilateral, rounded behind; valves rather thin; beaks small, slightly prominent, undulated at the tip; epidermis black, shining, striate; cardinal teeth rather compressed, oblique, acuminate, crenulate; lateral teeth long, lamellar and somewhat curved; nacre white and very iridescent.



21. *Unio hebes*
 22. *Unio reactus*
 23. *Unio superfluus*

Hab. Alexandria, Louisiana, J. Hale, M. D.

My cabinet and cabinets of Dr. Hale, and Acad. of Nat. Science.

Diam. .7, Length 1.3, Breadth 2.2 inches.

Shell smooth, elliptical, rather convex, inequilateral, rounded behind; substance of the shell rather thin; beaks small, slightly prominent, undulated at the tip; ligament rather long and thin; epidermis shining, black, striate, in the young radiate all over the disk; marks of growth rather distant; posterior slope compressed into a small carina; umbonial slope slightly raised and rounded; cardinal teeth rather large, somewhat compressed, oblique, acuminate, crenulate and double in both valves; lateral teeth long, lamellar, somewhat curved and separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed near the edge of the plate and on the cardinal tooth; cavity of the shell rather shallow; cavity of the beaks shallow and subrotund; nacre white and very iridescent.

Remarks.—This species is nearly allied to *U. Halcianus*, (Nobis,) but differs in the outline, and is not so wide; in the epidermis, which is blacker and more shining, and in the beaks, the undulations of which are more numerous and less regular. It belongs to that group of which *U. Nashvillianus*, (Nobis,) may be considered the type, the beaks being very much, in their undulations, of the character of that species. All the adults, male and female, of which I have many specimens, are very black and apparently without rays, but when held up to a strong light, delicate obscure rays may be observed, particularly about the umbonial slope. In the individuals of one-third growth and less, the epidermis is dark-green and covered with rays. The female differs very much in outline from the male, and is much inflated on that portion of the disk which tends to the posterior basal margin. In this very much enlarged female characteristic, this species resembles *Nashvillianus*, *Halcianus* and *parvus*. This enlargement makes that margin obliquely truncate.

UNIO PREVOSTIANUS. Pl. XIX. Fig. 24.

Testâ lævi, ellipticâ, subcompressâ, valdè inequilaterali, posticè rotundatâ; valvulis pertenuibus; natibus parvis, prominulis, ad apices undulatis; epidermide luteâ, tenebroso-radiatâ, politâ; dentibus cardinalibus parvissimis, compressis, perobliquis; lateralibus longis, lamellatis subcurvisque; margaritâ cœruleâ et iridescente.

Shell smooth, elliptical, rather compressed, very inequilateral, rounded behind; valves very thin; beaks small, slightly prominent, undulated at the tip; epidermis yellow, very much and darkly radiated, polished; cardinal teeth very small, compressed, very oblique; lateral teeth long, lamellar and somewhat curved; nacre bluish and iridescent.

Hab. Eutowah River, Georgia, Mr. C. M. Wheatley.

Cabinet of Mr. Wheatley.

Diam. .7, Length 1.2, Breadth 2.3 inches.

Shell smooth, elliptical, rather compressed, very inequilateral, rounded behind; substance of the shell very thin; beaks small, slightly prominent, undulated at the tip; ligament long and thin; epidermis polished, yellow, with numerous broad dark-green rays covering nearly the whole disk, lighter before and very dark behind, with very distant marks of

growth; posterior slope compressed and raised into a carina and very dark-green; umbonal slope but slightly raised and rounded; cardinal teeth very small, compressed, very oblique, double in both valves; lateral teeth long, lamellar, somewhat curved and abrupt at the posterior end, separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the cavity of the beaks and on the under side of the plate; pallear cicatrices very indistinct; cavity of the shell rather shallow and rounded; cavity of the beaks shallow and subangular; nacre bluish and beautifully iridescent.

Remarks.—A single specimen only was received by Mr. Wheatley from Georgia. In outline it is very much the same as *U. radiatus*, but it is a much thinner shell, and in its polish, rays, and thinness allied to *U. Modioliformis*, (Nobis.) The rays in this specimen are so numerous, broad and dark, as to give the shell quite a tenebrose appearance, almost obliterating the yellowishness of the epidermis.

I name this species after Professor Prevost of Geneva, who, in his able memoir, "De la generation chez les moules des peintres" (*Unio pictorum*) was the first by anatomical demonstration to prove the *Naiades* to be dioecious; it having been previously supposed the male and female organization existed in the same individual. (See Mem. de la Soc. de l'Hist. Nat. de Geneve, March 17, 1825.)

UNIO POWELLII. Pl. XIX. Fig. 25.

Testâ lævi, ellipticâ, subinflatâ, inæquilaterali, posticè angulatâ; valvulis subtenuibus; natibus subprominentibus; epidermide olivaceâ, nitidâ, eradiatâ; dentibus cardinalibus parvis, subcompressis, obliquis, acuminate; lateralibus prælongis subcurvisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, somewhat inflated, inequilateral, angular behind; valves rather thin; beaks rather prominent; epidermis olivaceous, shining, without rays; cardinal teeth small, rather compressed, oblique, acuminate; lateral teeth very long and somewhat curved; nacre white and iridescent.

Hab. Saline river, Arkansas, J. Hale, M. D., and Professor Powell.

My cabinet and cabinets of Dr. Hale and Prof. Powell.

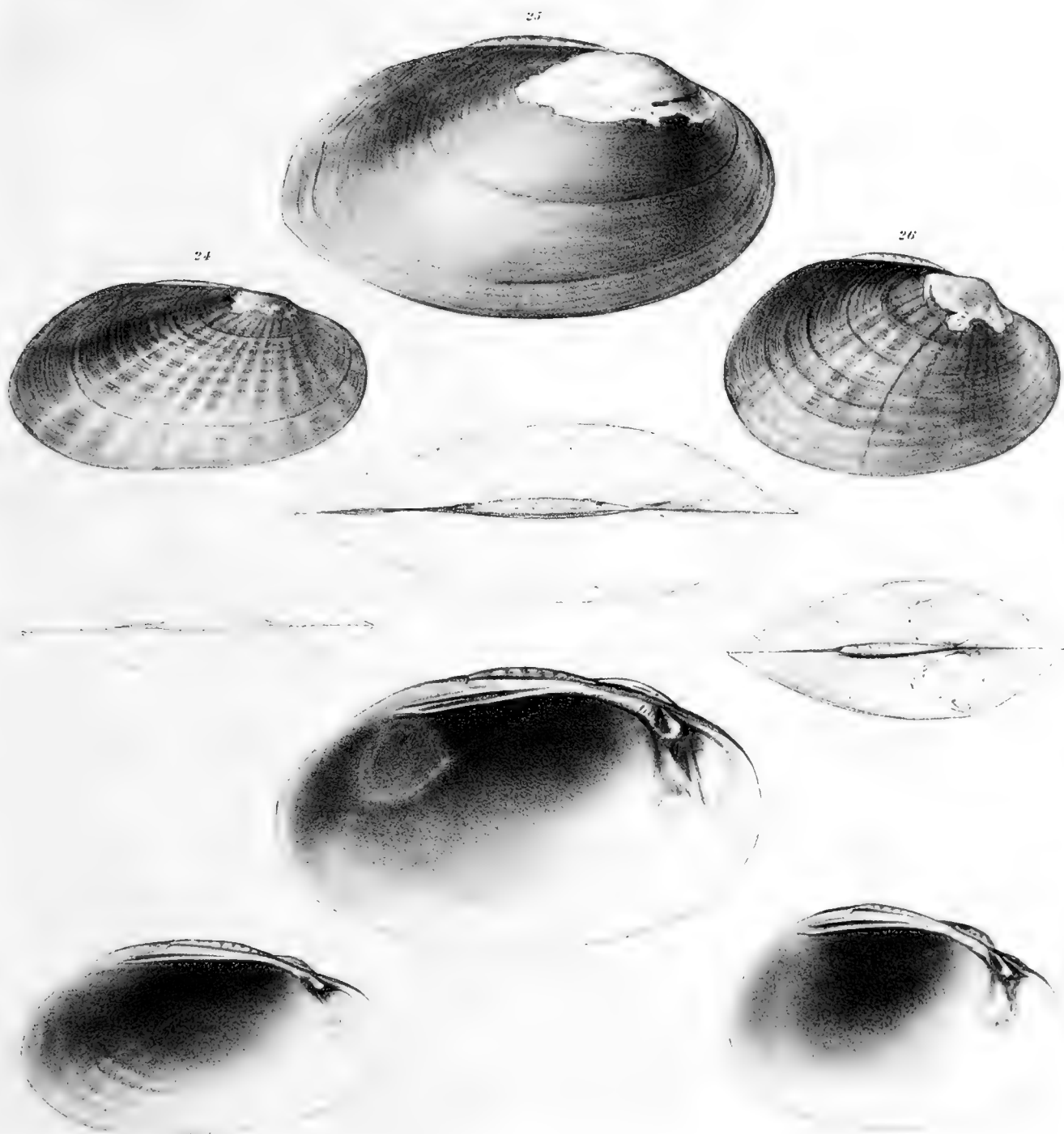
Diam. 1.1,

Length 1.8,

Breadth 3.1 inches.

Shell smooth, elliptical, somewhat inflated, inequilateral, angular behind; substance of the shell rather thin, thicker before; beaks rather prominent and placed towards the anterior margin; ligament long and rather thick; epidermis olivaceous, shining, without rays, with distant, indistinct marks of growth; posterior slope rather depressed, with two slightly impressed lines from the beaks to the posterior margin; umbonal slope subangular; cardinal teeth small, rather compressed, oblique, pointed, crenulate, single in the right and double in the left valve; lateral teeth very long, somewhat lamellar, curved, separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the under side of the plate between the teeth; pallear cicatrices impressed; cavity of the shell rather deep; cavity of beaks deep and obtusely angular; nacre white and iridescent.

Remarks.—I owe to the kindness of Dr. Hale and Prof. Powell several specimens of this species of both sexes. It belongs to that group of which *cariosus*, Say, may be con-



24 *Unio Prevostianus*
 25 . *Powellii*
 26 . *affinis*

sidered the type. In its outline it approaches the *luteolus*, Lam., but is not quite so transverse, while it is more so than *cariosus*. Two of the specimens are richly salmon-coloured in the cavity of the shell—the others are all white. The females are very much enlarged over the umbonial slope, and expanded at the posterior basal margin. None of the specimens which I received have any rays.

I have named this species in honour of Prof. W. Byrd Powell, of Memphis, Tenn.

UNIO AFFINIS. Pl. XIX. Fig. 26.

Testa lævi, ellipticâ, convexâ, inequilaterali, posticè rotundatâ; valvulis subtenuibus; natibus subprominentibus; epidermide radiatâ, luteolâ, nitidâ; dentibus cardinalibus parvis, compressis, obliquis, acuminatis, crenulatis; lateralibus sublongis, lamellatis subcurvisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, convex, inequilateral, rounded behind; valves rather thin; beaks rather prominent, epidermis rayed, yellowish, shining; cardinal teeth small, compressed, oblique, acuminate, crenulate; lateral teeth rather long, lamellar and rather curved; nacre white and iridescent.

Hab. Alexandria, Louisiana, J. Hale, M. D.

My cabinet.

Diam. .9,

Length 1.4,

Breadth 2.1 inches.

Shell smooth, elliptical, convex, inequilateral, rounded behind and inflated over the umbones; substance of the shell rather thin; beaks rather prominent, placed towards the anterior margin; ligament rather short and somewhat thick; epidermis shining, yellowish, with numerous rays and rather distant marks of growth; posterior slope rather elevated; umbonial slope rounded and inflated; cardinal teeth small, compressed, oblique, acuminate, crenulate, double in both valves; lateral teeth rather long, lamellar, slightly curved, separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed across the cavity of the beak under the cardinal tooth; cavity of the shell rather deep and rounded; cavity of the beaks rather shallow and subangular; nacre white and iridescent.

Remarks.—The outline of the specimen before me is of a remarkably regular oval. It belongs to the group of which *cariosus*, Say, may be considered the type. It is nearest in general character to *U. crocatus*, (Nobis,) but it is a larger species, not angular behind, and the rays are broader.

UNIO PROXIMUS. Pl. XX. Fig. 27.

Testa lævi, ellipticâ, subinflatâ, subinequilaterali, posticè rotundatâ; valvulis tenuibus; natibus parvis, subprominentibus; epidermide luteâ, radiatâ; dentibus cardinalibus valdè compressis, obliquis, acuminatis; lateralibus longis, lamellatis subrectisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, somewhat inflated, subinequilateral, rounded behind; valves thin; beaks small, somewhat prominent; epidermis yellowish, radiated; cardinal teeth much compressed, oblique, acuminate; lateral teeth long, lamellar and nearly straight; nacre white and iridescent.

Hab. Georgia. J. P. Barratt, M. D.

My cabinet and cabinet of Dr. Barratt.

Diam. .7,

Length 1.2,

Breadth 2.1 inches.

Shell smooth, elliptical, somewhat inflated, rather inequilateral, rounded behind; substance of the shell thin; beaks small, slightly prominent; ligament rather short and thin; epidermis yellowish, with rather small, somewhat distant rays on the posterior portion of the disk, and with strong distant marks of growth; posterior slope rather depressed; umbonial slope gradually rounded; cardinal teeth much compressed, oblique, acuminate, double in both valves; lateral teeth thin, rather long, lamellar, nearly straight and separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed rather below the centre of the cavity of the beaks; pallear cicatrix impressed anteriorly; cavity of the shell rather deep; cavity of the beaks rounded; nacre white and iridescent.

Remarks.—I have before me but a single specimen of this shell, and with older, younger or more perfect specimens, the characters are very likely to vary. In nearly all its characters it is most nearly allied to *U. obscurus*, (Nobis.) It differs in being less angular at the posterior margin, in being a thinner shell, and in having the teeth lamellar and thin. The colour of this specimen is white, while the *obscurus* is usually partly purplish.

UNIO REEVEIANUS. Pl. XX. Fig. 28.

Testa lævi, ellipticâ, inflatâ, valdè inequilaterali, posticè obtuso-angulatâ; valvulis tenuibus; natibus parvis, prominulis; epidermide luteâ, radiatâ; dentibus cardinalibus parvis, subobliquis; lateralibus longis, tenuibus subcurvisque; margaritâ albâ et iridescente.

Shell smooth, elliptical, inflated, very inequilateral, obtusely angular behind; valves thin; beaks small, a little prominent; epidermis yellowish, radiated; cardinal teeth small, rather oblique; lateral teeth long, thin and curved; nacre white and iridescent.

Hab. Alexandria, Louisiana, J. Hale, M. D., and Prof. Powell.

My cabinet and cabinets of Dr. Hale and Prof. Powell.

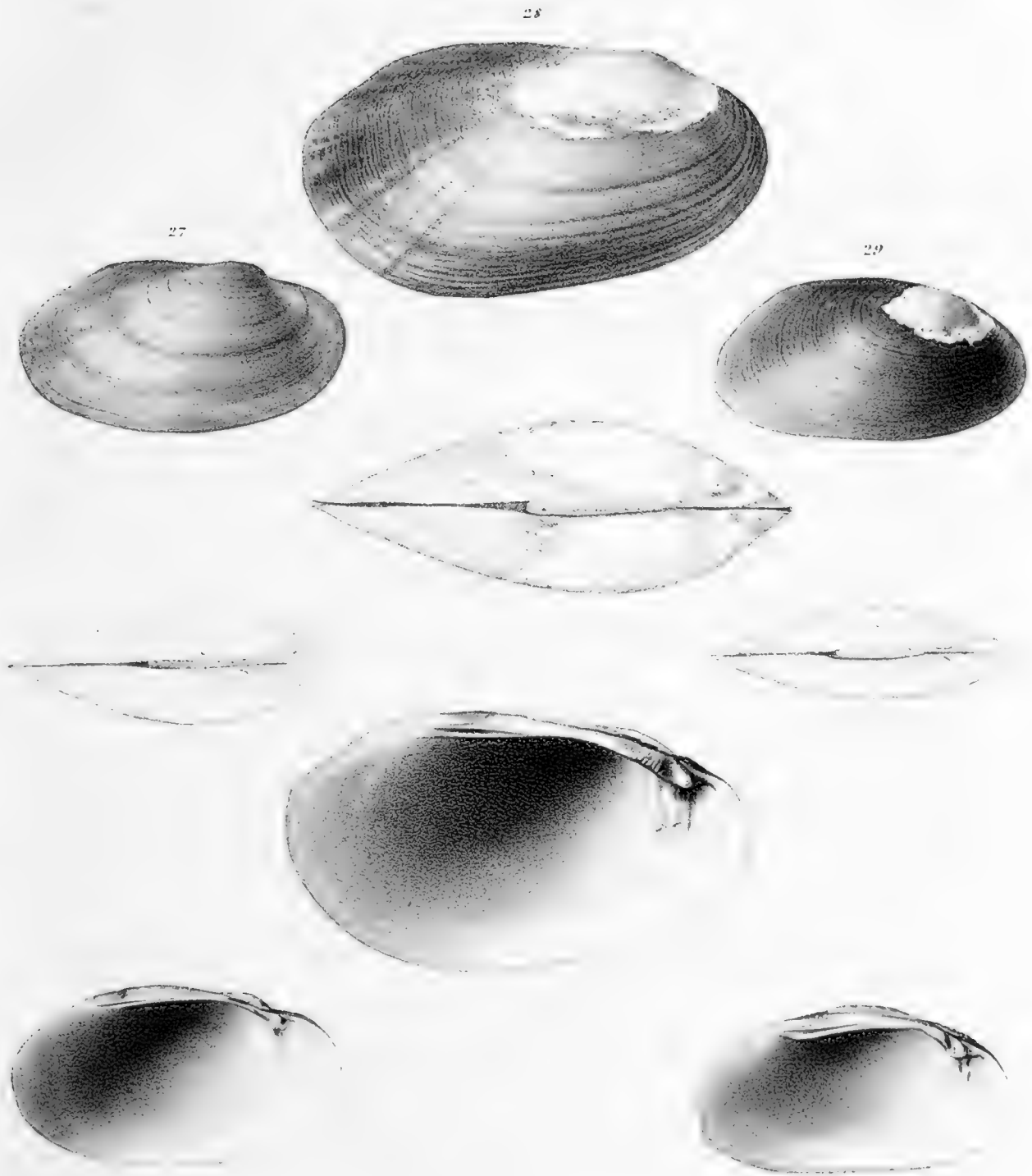
Diam. 1.1,

Length 1.6,

Breadth 2.9 inches.

Shell smooth, elliptical, inflated, very inequilateral, obtusely angular behind; substance of the shell thin, thicker before; beaks small and a little prominent; ligament rather long and somewhat thick; epidermis yellowish, shining, with numerous green rays over the posterior portion of the shell and distant lines of growth; posterior slope rather compressed into a carina; umbonial slope but slightly raised and rounded; cardinal teeth small, rather oblique, double in the right and slightly double in the left valve; lateral teeth long, thin, somewhat curved, widely separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the under side of the plate; pallear cicatrix impressed; cavity of the shell deep; cavity of the beaks rather shallow and subangular; nacre white and iridescent.

Remarks.—Among the many interesting shells sent to me by Dr. Hale and Prof. Powell, were two specimens which are now before me. The larger one, which is here figured, is apparently a male, the other a female. They differ much, the latter being much smaller, but apparently grown. It is very much broader on the posterior portion, and somewhat truncate. In colour and form of rays the two specimens are the same. Neither of them are by any means perfect, being much eroded towards the beaks, the character of which,



27 *Unio proximus*
28 . *Reverianus*
29 . *luridus*

in regard to undulations, cannot be ascertained. In general outline and characteristics, it is allied to *U. luteolus*, Lam. It is, however, thinner and lighter in the substance of the shell, and the rays are not so broad. The teeth, too, are smaller, and the lateral are much more removed from the cardinal ones. In the two specimens before me the division of the lateral teeth is remarkably short, not reaching more than half the length of the tooth.

I dedicate this species to Lovell Reeve, Esq., the able author of "Conchologia Iconica."

UNIO LURIDUS. Pl. XX. Fig. 29.

Testá lævi, ellipticâ, compressâ, valdè inæquilaterali, posticè subbiangulatâ; valvulis subcrassis; natibus parvis, vix prominulis; epidermide tenebroso-bruneâ, striatâ, eradiatâ; dentibus cardinalibus parvis, acuminatis; lateralibus longis curvisque; margaritâ vel cæruleâ-albâ vel salmonis colore tinctâ.

Shell smooth, elliptical, compressed, very inequilateral, subbiangular behind; valves somewhat thick; beaks small, scarcely prominent; epidermis dark-brown, striate, without rays; cardinal teeth small, acuminate; lateral teeth long and curved; nacre bluish-white or salmon-coloured.

Hab. Coosawattee river, Murray county, Georgia, Dr. Boykin.

My cabinet.

Diam. .6,

Length 1,

Breadth 2 inches.

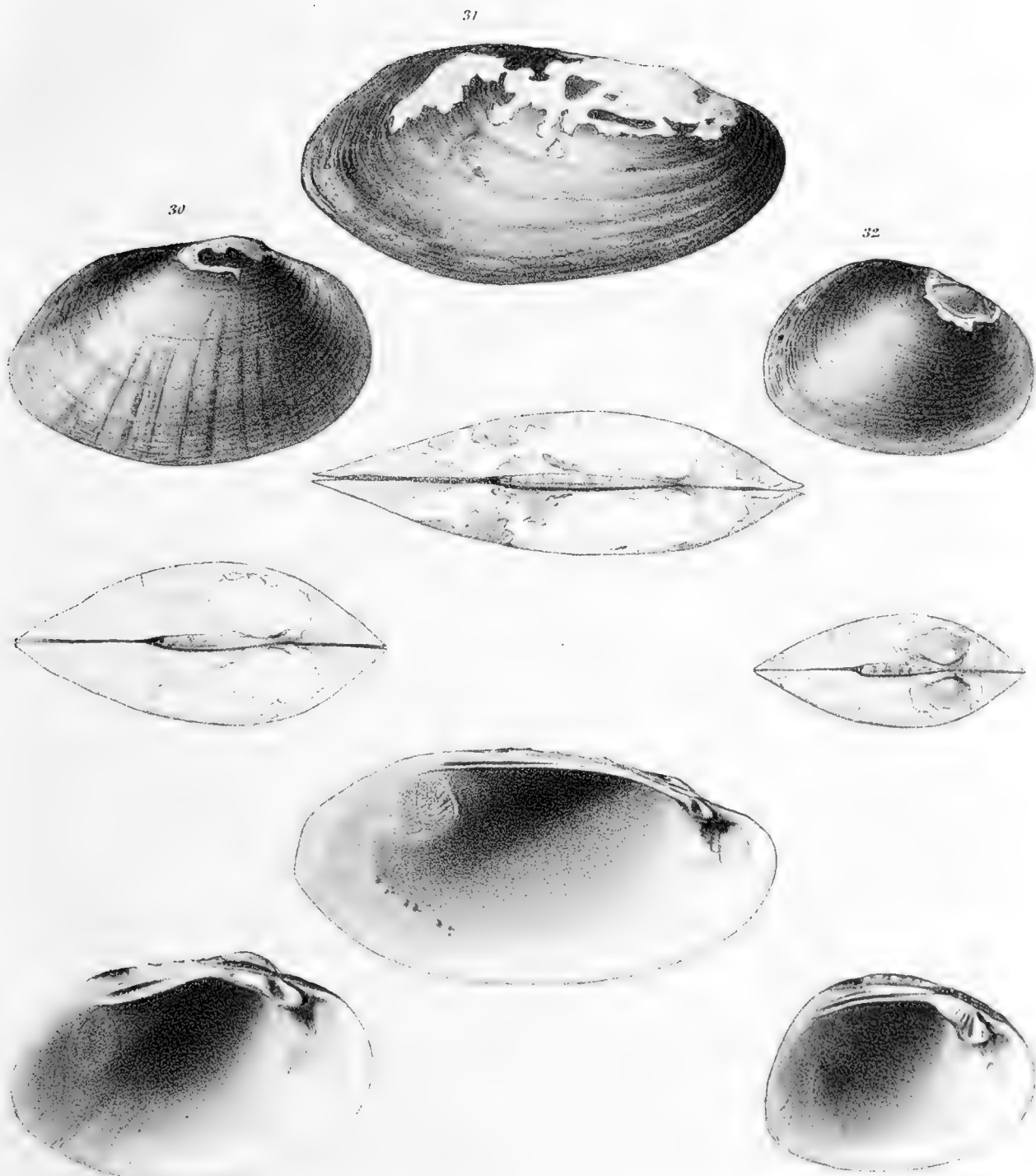
Shell smooth, elliptical, compressed, very inequilateral, subbiangular behind; substance of the shell somewhat thick; beaks small, scarcely prominent, placed towards the anterior margin; ligament rather long and thin; epidermis dark-brown, striate, without any apparent rays, with rather distant marks of growth; posterior slope rather compressed; umbonal slope very slightly raised into a scarcely visible angle; cardinal teeth small, acuminate, double in the left and single in the right valve; lateral teeth long, curved and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed above the centre of the cavity of the beaks; pallear cicatrices slightly impressed; cavity of the shell very shallow; cavity of the beaks exceedingly shallow and rounded; nacre bluish-white and salmon coloured.

Remarks.—Some half dozen of this small, unattractive species I owe to the kindness of my late friend, Dr. Boykin. Two of them are slightly salmon coloured, the others are bluish-white. It is somewhat like *U. complanatus*; but, in outline, it is more like *occultus*, (Nobis,) the beak is more terminal than in either, and the whole appearance of the shell reminds one of *U. arctior*, (Nobis,) but it is not so wide a shell. Several of the specimens are not so dark a brown as the others, but are inclined to dark-olive.

UNIO CLARKIANUS. Pl. XXI. Fig. 30.

Testâ lævi, ellipticâ, convexâ, ad umbonis inflatâ, inequilaterali, posticè angulatâ; valvulis crassis; natibus subprominentibus, subrotundis; epidermide rufo-fuscâ, nitidâ; dentibus cardinalibus subcrassis, acuminatis, granulatis; lateralibus subbrevis, crassis, arcuatis; margaritâ vel albâ vel salmonis colore tinctâ et iridescente.

Shell smooth, elliptical, convex, on the umbones inflated, inequilateral, angular behind; valves thick; beaks rather prominent, subrotund; epidermis reddish-brown, shining; cardinal teeth rather thick, acuminate, granular; lateral teeth rather short, thick and arched; nacre white or salmon coloured and iridescent.



30 *Unio Clarkianus*
 31 *Unio Floridensis*
 32 *Unio succissus*

A single specimen only is under my inspection, and this is much eroded on the superior portion, leaving only false beaks. It is not, of course, possible to say whether the tips are undulate or not.

UNIO SUCCISSUS. Pl. XXI. Fig. 32.

Testâ lævi, subtriangulari, subcompressâ, inæquilaterali, tenebroso-fuscâ; valvulis subcrassis; natibus subprominentibus; dentibus cardinalibus magnis; lateralibus parvis subrectisque; margaritâ purpureâ et valdè iridescente.

Shell smooth, subtriangular, rather compressed, inequilateral, dark-brown; valves rather thick; beaks somewhat prominent; cardinal teeth large; lateral teeth nearly straight; nacre purple and very iridescent.

Hab. West Florida, Major Le Conte.

My cabinet and cabinets of Major Le Conte and Prof. Haldeman.

Diam. .7, Length 1.2, Breadth 1.7 inches.

Shell smooth, subtriangular, rather compressed, inequilateral, subangular behind and rounded before, subangular on the umbonial slope, dark-brown; beaks somewhat prominent and placed near the anterior margin; ligament very short and rather thin; epidermis dark-brown, with indistinct, rather distant lines of growth, smooth on the superior portion, striate and rather rough towards the margin, apparently without rays; cardinal teeth large, rather erect, double in both valves; lateral teeth rather short, thin, and very slightly curved; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed on the inferior portion of the cardinal teeth, within the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks deep and angular; nacre purple, somewhat clouded, and very iridescent.

Remarks.—A single specimen of this species was sent to me by Major Le Conte. The beaks, being eroded, do not present the means of ascertaining if this be undulate at the tip. The general outline approaches very closely to *U. rubiginosus*, (Nobis,) but it is rather more carinate on the posterior slope, and more compressed on the anterior portion of the shell. It differs entirely from that species in its nacre, belonging, in regard to colour, to the *complanatus* group, which varies so much in purple, white and salmon. The specimens before me are not of a deep purple, but rather pale, and clouded with white. The margin and teeth are the darkest. In other individuals the colour may be found to vary from dark-purple to white.*

Prof. Haldeman's specimen is less triangular. It also came from Major Le Conte.

UNIO OREGONENSIS. Pl. XXII. Fig. 33.

Testâ lævi, ellipticâ, subinflatâ, subinæquilaterali, posticè obtusè angulatâ; valvulis crassis; natibus subprominentibus; epidermide tenebroso-olivaceâ, rugosâ, valdè striatâ, obsoletè radiatâ; dentibus cardinalibus magnis, obliquis, compressis et valdè crenulatâ; lateralibus longis, subcrassis curvatisque; margaritâ albâ et iridescente.

* Since the above was written, I have seen, in Mr. Wheatley's collection, two specimens from New Orleans, both of which are white.

Shell smooth, elliptical, somewhat inflated, inequilateral, obtusely angular behind; valves thick, beaks somewhat prominent; epidermis dark-olive, rough, very much striate, obsoletely radiated; cardinal teeth large, oblique, compressed and much crenulated; lateral teeth long, rather thick and curved; nacre white and iridescent.

Hab. Columbia river, Oregon, Mr. C. M. Wheatley.

Diam. .8,

Length 1.2,

Breadth 2.1 inches.

Shell smooth, elliptical, somewhat inflated, inequilateral, obtusely angular behind; substance of the shell thick, thinner behind; beaks somewhat prominent, submedial; ligament rather short and somewhat thick; epidermis dark-olive, very rough, and striate over the whole disk, with very obscure, rather thin rays; posterior slope somewhat compressed; umbonial slope obtusely angular; cardinal teeth large, oblique, compressed and much crenulated, double in the left and single in the right valve; lateral teeth long, rather thick, curved, enlarged at the posterior end and separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed obliquely on the inner portion of the cardinal tooth and under the plate; paleal cicatrix impressed; cavity of the shell rather shallow; cavity of the beaks shallow and subangular; nacre white and iridescent.

Remarks.—I owe to the kindness of Mr. Wheatley one of the two specimens before me. It is a species very distinct from any I am acquainted with. The roughness of the exterior is remarkable, and would indicate its inhabiting near to brackish waters. It is not usual to see a rough shell like this with rays. In those specimens which are eroded and old, they are indistinct; but I suspect that when perfect the rays might be very distinct. In outline, it is somewhat like a young *U. ligamentinus*, Lam., (*crassus*, Say,) and the nacre is of the same pure white, but the surface is totally different, being rough, and the form more transverse. In its elliptical outline it comes closer to *U. Sapotalensis*, (Nobis,) but is a smaller shell, and differs much in the rays and the surface.

UNIO RUMPHIANUS. Pl. XXII. Fig. 34.

Testâ tuberculatâ, quadratâ, subinflatâ, subinæquilaterali, posticè truncatâ, ad basim emarginatâ; valvulis percrassis; natibus crassis, prominentibus; epidermide rufo-fuscâ, substriatâ; dentibus cardinalibus percrassis striatisque; lateralibus brevibus rectisque; margaritâ argenteâ et iridescente.

Shell tuberculate, quadrate, somewhat inflated, rather inequilateral, truncate behind, emarginate at the basal margin; valves very thick; beaks thick and prominent; epidermis reddish-brown, substriate; cardinal teeth very thick and striate; lateral teeth short and straight; nacre silver white and iridescent.

Hab. West Georgia? Dr. Budd.

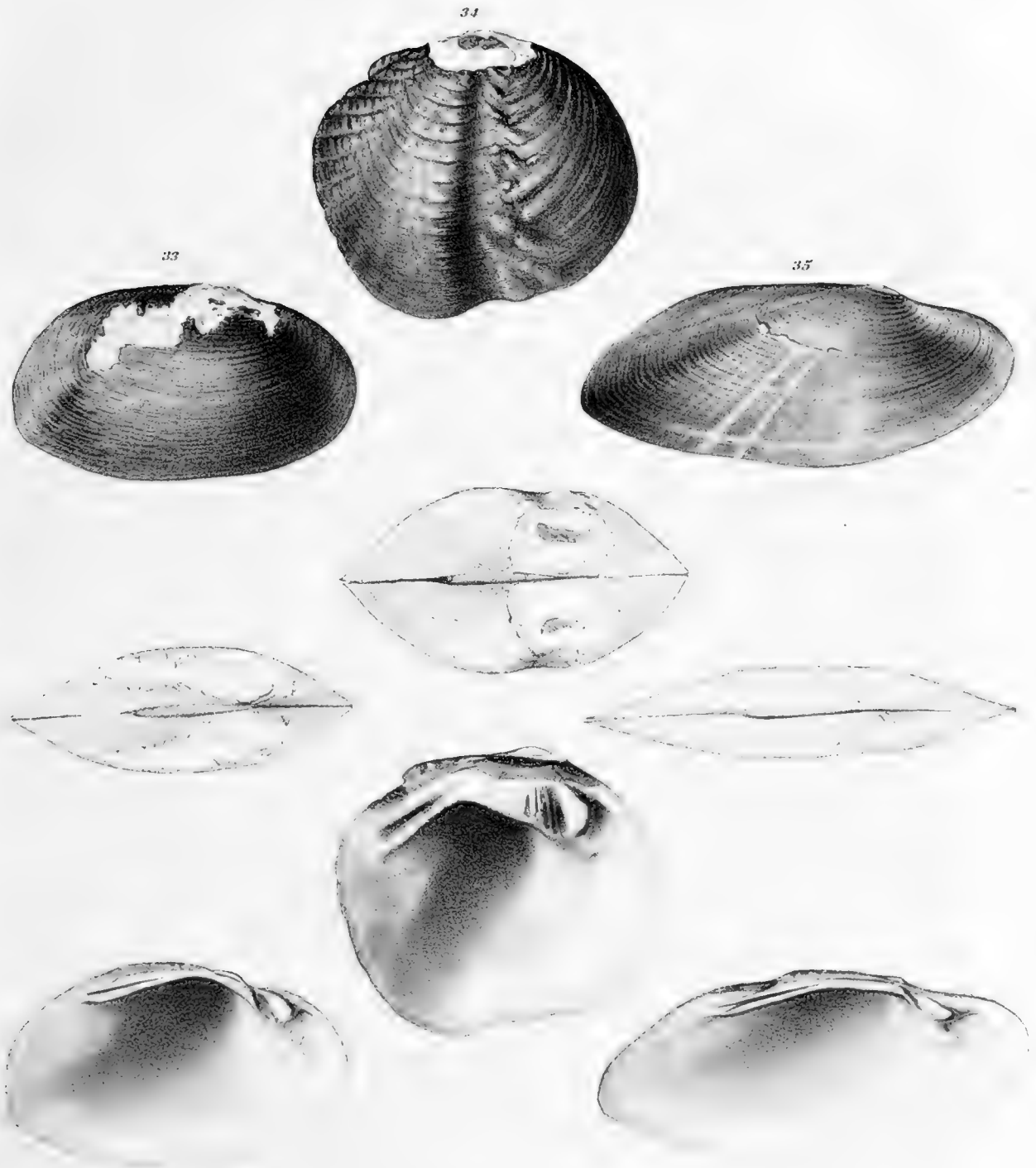
Cabinet of Dr. Budd, New York.

Diam. 1.1,

Length 1.7,

Breadth 2 inches.

Shell tuberculate, quadrate, somewhat inflated, rather inequilateral, truncate behind, emarginate at the basal margin, raised over the umbonial slope and grooved from beaks to basal margin; substance of the shell very thick, thinner behind; beaks thick, submedial and prominent; ligament short and thick; epidermis reddish-brown, somewhat striate, with distinct, proximate marks of growth; posterior slope compressed, raised into a carina and covered with curved rows of tubercles; umbonial slope raised into a widening ridge,



33 *Unio Oregonensis*
 34 " *Rhynchonella*
 35 " *sagittiformis*.

which enlarges the posterior basal margin; cardinal teeth very large, thick, spread out, and deeply striate; lateral teeth short, thick, straight, with a large, flat plate separating them from the cardinal teeth; anterior cicatrices distinct and deeply impressed; posterior cicatrices confluent; dorsal cicatrices placed on the inner side of the plate; pallear cicatrix impressed; cavity of the shell rather deep and small; cavity of the beaks very deep and angular; nacre silvery white and iridescent.

Remarks.—A single valve only was in the collection of Dr. Budd, and he thinks it came from the west of Georgia. I have had it in my possession for several years, and deferred describing it in the hope of getting more specimens; but in comparing it with its allied species, *metanever*, Raf., *tuberosus*, (Nobis,) and *sparsis*, (Nobis,) I have found it too different in outline and some other characters to place it with either. It is much more enlarged on the posterior slope, which is almost winged, and it is without a groove on that part, which the other three have. In this specimen the groove over the middle of the valve is deeper than in the other species. The anterior portion is more enlarged than in the others, and it has many rather low tubercles, the general character of which, over the whole disk, is rather depressed and smooth. In the *tuberosus* and *metanever* the tubercles are generally more raised and roughened. The tubercles on the posterior slope in this specimen arrange themselves in curved rows, which, running to the margin, make it crenulate.

The lateral teeth are remarkably short, straight, and very thick. The intervening plate between the cardinal and lateral teeth is exceedingly large and very flat.

I dedicate this species to the memory of Rumphius, the author of "D'Amboinsche Rariteitkamer."

UNIO SAGITTIFORMIS. Pl. XXII. Fig. 35.

Testâ lævi, valdè transversâ, compressâ, ad latere planulatâ, valdè inæquilaterali, posticè acutè angulatâ; valvulis subtenuibus; natibus parvis, prominulis, ad apices undulatis; epidermide virido-fuscâ, radiatâ; dentibus cardinalibus parvis, compressis, crenulatis; lateralibus prælongis subrectisque; margaritâ purpureâ et iridescente.

Shell smooth, very wide, compressed, flattened at the side, very inequilateral, acutely angular behind; valves rather thin; beaks small, slightly prominent, undulated at the tip; epidermis greenish-brown, rayed; cardinal teeth small, compressed, crenulate; lateral teeth very long and nearly straight; nacre purple and iridescent.

Hab. Oconee river, near Athens, Georgia, Major Le Conte.

My cabinet and cabinet of Major Le Conte.

Diam. .6,

Length 1.2,

Breadth 2.7 inches.

Shell smooth, very wide, compressed, flattened at the side, very inequilateral, acutely angular behind; substance of the shell thin; beaks small, slightly prominent, undulated at the tip and placed towards the anterior margin; ligament long and thin; epidermis brownish, with numerous broad, dark-green rays, covering the whole disk, with rather distant lines of growth; posterior slope somewhat compressed, with a single raised line passing from the beak to the posterior margin; umbonal slope rather acutely angular; cardinal teeth rather small, compressed, crenulate, double in both valves; lateral teeth long, nearly

straight, and thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; pallear cicatrix impressed; cavity of the shell very shallow; cavity of the beaks shallow and rounded; nacre purple and iridescent.

Remarks.—I have before me two specimens of this species, which belongs to the group of which the *U. nasatus*, Say, may be considered the type. Its form and appearance is altogether graceful. It perhaps more closely resembles *Fisherianus*, (Nobis,) than any other species, but may be distinguished in being rather less wide, and it differs in having broader rays. In outline, it resembles *U. Barrattianus*, (Nobis,) but it is a wider shell, and not so thick. The two specimens I have are both of a fine purple; others may differ, and it may be found white and salmon colour.

UNIO STEWARDSONII. Pl. XXIII. Fig. 36.

Testa lævi, triangulari, compressâ, inæquilaterali, posticè emarginatâ, ad basim prælongâ, ad laterè planulatâ; valvulis crassis; natibus prominulis; epidermide luteo-fuscâ, radiatâ; dentibus cardinalibus subcrassis, crenulatis; lateralibus brevissimis, crassis, crenulatis rectisque; margaritâ argenteâ et iridescente.

Shell smooth, triangular, compressed, inequilateral, emarginate behind, prolonged at the base and flattened at the side; valves thick; beaks rather prominent; epidermis yellowish-brown, radiated; cardinal teeth rather thick, crenulate; lateral teeth very short, thick and straight; nacre silvery white and iridescent.

Hab. Chatanooga river, Tenn., Thomas Stewardson, M. D.

Cabinet of the Academy of Natural Sciences.

Diam. .6,

Length 1,

Breadth 1.2 inches.

Shell smooth, triangular, compressed, inequilateral, emarginate behind, enlarged and extended circularly at the base, flattened at the side; substance of the shell thick, thinner behind; beaks rather prominent; ligament short and rather thin; epidermis yellowish dull-brown, with numerous capillary rays over most of the disk, and with distant marks of growth; posterior slope flattened and lighter in colour; umbonal slope obtusely angular; cardinal teeth rather thick, crenulate, double in both valves; lateral teeth very short, crenulate, thick, nearly straight, and thickened at the posterior end; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed near to the margin and almost in connexion with the cardinal tooth; pallear cicatrix impressed; cavity of the shell very shallow; cavity of the beaks shallow and subangular; nacre silvery white and iridescent.

Remarks.—Among many interesting specimens of some twenty species, brought by Dr. Stewardson, was a single specimen of this species. It is very closely allied to the *Unio foliatus*, Hild., and at first I did not hesitate to consider it as a small specimen of the female of that species, but a very slight examination of the enlargement of that portion of the shell which indicates the female character, satisfied me that it could not be the same. In the *foliatus* the enlargement for the oviducts is always a continuation and enlargement of the ridge over the middle of the disk; and immediately before this there is, in the mature female, a deep indentation. In the *Stewardsonii* this emarginate part is replaced by the enlargement, and instead of being indented at the posterior basal margin,



- 36 *Umo Stewardsoni*
 37 " *Hanleyanus*
 38 " *placatus*
 39 " *Troschelianus*
 40 " *Keenerianus*.

it really is there enlarged. The position, therefore, of the oviducts of the animal, which I have not seen, must be different. Judging from this single specimen, I should think it will prove to be a much smaller species than the *foliatus* of the Ohio.

I name it after Dr. Stewardson, to whose exertions we are indebted for its discovery.

UNIO HANLEYIANUS. Pl. XXIII. Fig. 37.

Testâ lævi, obliquâ, tumidâ, valdè inæquilaterali, posticè angulatâ; valvulis percrassis; natibus grandibus, tumidis; epidermide bruneo-olivâ, striatâ, eradiatâ; dentibus cardinalibus parvis, pyramidalis; lateralibus brevis rectisque; margaritâ albâ et iridescente.

Shell smooth, oblique, swollen, very inequilateral, angular behind; valves very thick; beaks large and swollen; epidermis brownish-olive, striate, without rays; cardinal teeth small, pyramidal; lateral teeth short and straight; nacre white and iridescent.

Hab. Coosawattee river, Murray county, Georgia. Dr. Boykin.

My cabinet.

Diam. .8,

Length .9,

Breadth 1.4 inches.

Shell smooth, oblique, swollen, very inequivalve, angular behind; substance of the shell very thick, much thinner behind; beaks large, swollen and placed towards the anterior margin; ligament short and thin; epidermis brownish-olive, striate, without rays and with close marks of growth; posterior slope wide and rather depressed; umbonial slope raised, very obtusely angular; cardinal teeth small, pyramidal, single in the right, and double in the left valve; lateral teeth short, straight and in a direction much above the cardinal tooth; anterior cicatrices distinct and deeply impressed; posterior cicatrices distinct; dorsal cicatrices on the under side of the plate; pallear cicatrix impressed; cavity of the shell deep and irregularly oval; cavity of the shell shallow and obtusely angular; nacre white and iridescent.

Remarks.—Three or four specimens are before me, differing very little from each other. The marks of growth are unusually close together, and are much darker than the interspace, which is brownish-olive. It is a pretty little species, and is allied to *U. decisus*, (Nobis,) and *scalenius*, Raf., and approaches *U. pulvinulus*, (Nobis.) It differs from the first in not having the beaks so terminal, and not being so much swollen on the anterior portion of the disk; from the second, in not having the beaks so terminal, in being more oval and in being without rays. From the last it differs in being less rounded, of a lighter colour, and having the marks of growth closer.

I dedicate this species to Sylvanus Hanley, Esq., one of the authors of "History of British Mollusca," &c.

UNIO PLACITUS. Pl. XXIII. Fig. 38.

Testâ lævi, ellipticâ, subinflatâ, inæquilaterali, posticè subangulatâ; valvulis subcrassis; natibus subprominentibus, rotundatis; epidermide castaneâ, nitidâ, obsolete radiatâ; dentibus cardinalibus subparvis, compressis, per obliquis, crenulatis; lateralibus sublongis, lamellatis curvisque; margaritâ salmonis colore tinctâ.

Shell smooth, elliptical, rather inflated, inequilateral, subangular behind; valves a little thick; beaks somewhat prominent, rounded; epidermis chestnut-coloured, shining, obsoletely rayed; cardinal teeth rather small, compressed, very oblique, crenulate; lateral teeth rather long, lamellar and curved; nacre salmon coloured.

Hab. Alabama, Mr. C. M. Wheatley.

Cabinet of Mr. Wheatley.

Diam. .5,

Length .8, .

Breadth 1.3 inches.

Shell smooth, elliptical, rather inflated, inequilateral, angular behind; substance of the shell a little thick; beaks somewhat prominent, rounded, ligament short and thin; epidermis chestnut-coloured, shining, obsoletely rayed, with rather distant marks of growth; posterior slope rather depressed; umbonial slope slightly raised and round, cardinal teeth rather small, compressed, very oblique, crenulate and double in both valves; lateral teeth rather long, lamellar, curved and separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the under side of the plate; cavity of the shell rather deep and regularly oval; cavity of the beaks small and subangular; nacre salmon coloured.

Remarks.—This is a small, regular and pretty-looking shell, of which only one specimen was in Mr. Wheatley's collection. I could not place it in any species known to me. It may not be a fully grown specimen. It is nearest in outline to *U. constrictus*, Con., in those specimens where the margin is not constricted, which is often the case. It differs from it in being a thicker shell, more regularly oval, and being fuller on the umbones and on the umbonial slope. In the rays it also differs, having fewer, and these being more distant. It is also rounder on the posterior margin. The nacre of the specimen before me is of a pale salmon colour, inclining to rose. Other specimens will be likely to vary in colour.

UNIO TROSCHELIANUS. Pl. XXIII. Fig. 39.

Testá lævi, subobliquâ, convexiusculâ, inæquilateralî, posticè subangulatâ; valvulis crassis; natibus subgrandibus; epidermide bruneo-olivâ, striatâ, eradiatâ; dentibus cardinalibus parvis, granulatis; lateralibus brevis, crassis rectisque; margaritâ albâ et iridescente.

Shell smooth, suboblique, somewhat convex, inequilateral, subangular behind; valves thick; beaks rather large; epidermis brownish-olive, striate, without rays; cardinal teeth small, granulate; lateral teeth short, thick and straight; nacre white and iridescent.

Hab. Coosawattee river, Murray county, Georgia, Dr. Boykin.

My cabinet.

Diam. .7,

Length 1.1,

Breadth 1.5 inches.

Shell smooth, rather oblique, somewhat convex, inequilateral, subangular behind, rounded before; substance of the shell thick, thinner behind; beaks rather large, sub-medial; ligament rather short and thin; epidermis brownish-olive, striate, without rays, and with very close marks of growth; posterior slope somewhat compressed; umbonial slope rounded; cardinal teeth small, granulate, single in the right and double in the left valve; lateral teeth short, thick and straight; anterior cicatrices distinct, posterior cicatrices distinct; dorsal cicatrices placed on the under side of the plate; pallear cicatrix well impressed; cavity of the shell rather shallow and rounded; cavity of the beaks very shallow and obtusely angular; nacre white and iridescent.

Remarks.—Several specimens are before me, neither of which have perfect beaks.

Whether there be undulations at the tips it is impossible to say. In outline, it is somewhat like *U. Ravenclianus*, (Nobis,) but it is less oblique and less compressed. It is also allied to *U. nucleopsis*, Con., but that is quite round in the outline, while the former is rather oblique. It is also much more compressed.

I dedicate this species to M. Troschel, who has done much in the anatomy of this family.

UNIO KEINERIANUS. Pl. XXIII. Fig. 40.

Testâ tuberculatâ, subrotundatâ, subinflatâ, subequilaterali; valvulis crassis; natibus prominentibus, submedialis; epidermide luteolâ, substriatâ; dentibus cardinalibus grandibus, granulatis crassisque; lateralibus brevis, crassis subrectisque; margaritâ albâ et iridescente.

Shell tuberculate, subrotund, somewhat inflated, subequilateral; valves thick, beaks prominent, submedial; epidermis yellowish, somewhat striate; cardinal teeth large, granulate and thick; lateral teeth short, thick and nearly straight; nacre white and iridescent.

Hab. Coosawattee river, Murray county, Georgia, Dr. Boykin.

My cabinet.

Diam. .7,

Length 1.1,

Breadth 1.3 inches.

Shell sparsely tuberculate, subrotund, somewhat inflated, nearly equilateral, rounded behind; substance of the shell thick, rather thinner behind; ligament short and rather thick; epidermis yellowish, somewhat striate near the margin, with very close marks of growth; posterior slope wide and but slightly raised; umbonial slope rounded; cardinal teeth large, granulate, thick, double in the left and somewhat trifid in the right valve; lateral teeth short, thick, nearly straight, far removed from, and in a direction far above the cardinal tooth, leaving a large plate between the two teeth; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices in a row under the cardinal teeth; pallear cicatrix well impressed; cavity of the shell moderately deep; cavity of the beaks deep and angular; nacre white and iridescent.

Remarks.—I very much regret that I have not better specimens of this species. The four before me are all worn in the beaks more or less, and two of them are quite old and eroded. The two younger ones only have rays. The older of these, here figured, has a broad, green ray over the middle and anterior portion of the disk, and two small ones on the posterior slope. On the youngest specimen, about one-fourth grown, there is no tubercle; on the others they are very few and very small, and placed towards the margin. These are so small as scarcely to deserve the name. This species belongs to the group of which *U. pustulosus*, (Nobis,) may be considered the type. It differs from that shell in being rounder and having fewer tubercles, in being less angular behind and more rounded before. It is allied to *U. Schoolcraftensis*, (Nobis,) but that is more quadrate, having quite a compressed carina, but resembles it in having few tubercles. The two oldest specimens are slightly impressed before the umbonial slope and are subangular behind.

I dedicate it to Mr. L. C. Keiner, the author of "Spécies Général et Icon. Coquil. Vivantes."

UNIO INGALLSIANUS. Pl. XXIV. Fig. 41.

Testâ lævi, transversâ, inflatâ, cylindraceâ, posticè acuto-angulatâ, e natibus posticè bilineatis; valvulis subtenuibus; natibus subprominentibus; epidermide tenebroso-olivaceâ, striatâ; dentibus cardinalibus prælongis, laminatis et in valvulâ dextrâ solum duplicibus; lateralibus longis, laminatis, rectis; margaritâ cæruleo-albâ et valdè iridescente.

Shell smooth, transverse, inflated, cylindrical, acutely angular behind, with two lines posteriorly from the beaks; valves rather thin; beaks rather prominent; epidermis dark-olive, striate; cardinal teeth very long, lamelliform, straight and in the right valve only double; lateral teeth long, lamelliform, straight; nacre bluish-white and very iridescent.

Hab. Siam, Thomas R. Ingalls, M. D.

My cabinet and cabinet of Dr. Ingalls.

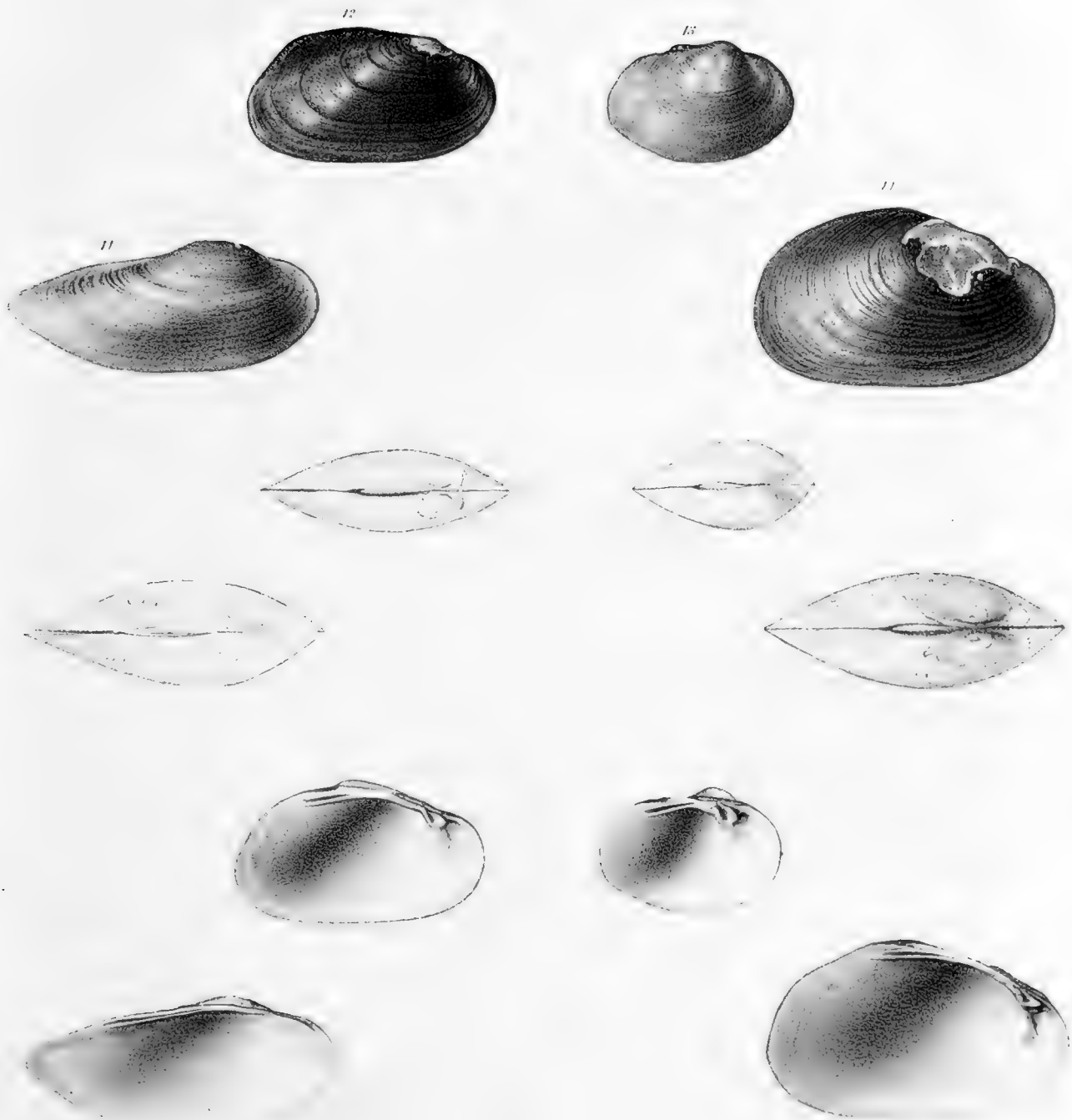
Diam. .7,

Length .8,

Breadth 1.9 inches.

Shell smooth, very transverse, inflated, cylindrical, acutely angular behind, obtusely rounded before, with two minute, slightly elevated lines running from the beaks towards the posterior margin, on the posterior slope flattened, near the basal margin slightly compressed; substance of the shell rather thin; beaks rather prominent, submedial; ligament short and rather thick; epidermis dark-olive, dull, striate over the whole disk, without rays; umbonial slope obtusely angular; cardinal teeth very long, lamelliform, straight, and in the *right valve* only, double; lateral teeth long, lamelliform, straight and double in the left valve; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed on the plate immediately over the centre of the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks rather shallow and rounded; nacre bluish-white, pearly and iridescent.

Remarks.—This very interesting shell was sent to me by Dr. Ingalls, of Greenwich, N. Y. It was the only new one among several he received from Siam. To his kindness for this and other species, I am indebted, and I dedicate it to him. The form is very unusual, and assimilates to the *U. Caillaudii*, Fer., from Egypt. The colour is of the same dull olive. It may be distinguished in the exterior by its being less cylindrical and more angular behind; and in the interior, by the peculiar form of the cardinal teeth, which are long and lamelliform and double in the *right valve*, while in the *Caillaudii* they are short, erect, and double in the left valve. The beaks are also much more medial. The nacre is of an uncommonly fine pearly character, and in this specimen it is delicately striate from the cavity of the beaks towards the margin. In the description, it may be observed that I have stated the anterior cicatrices to be confluent, a rather unusual character in the *Uniones*. Of the smaller under cicatrix there is no appearance in this specimen, but it may be embraced in the large one. There is, however, a very distinct cicatrix *above* the large one. It is much to be regretted that the soft parts were not preserved, as the peculiar cardinal teeth and muscular cicatrices indicate a different disposition of the muscular fibres of the adductor and retractor muscles. The enlargement on the posterior portion of the disk towards the basal margin, indicates the female character of this specimen.



- 11 Unio lugallianus*
12 " nigellus
13 " nigrinus



UNIO NIGELLUS. Pl. XXIV. Fig. 42.

Testâ lævi, ellipticâ, anticè compressâ, valde inæquilaterali, posticè obtuso-biangulatâ; valvulis tenuibus; natibus prominulis; epidermide nitidâ, nigrâ; dentibus cardinalibus parvis, acuminatis, crenulatis; lateralibus prælongis curvisque; margaritâ cæruleo-albâ et valde iridescente.

Shell smooth, elliptical, compressed before, very inequilateral, obtusely biangular behind; valves thin; beaks a little prominent; epidermis shining, black; cardinal teeth small, pointed, crenulate; lateral teeth long and curved; nacre bluish-white and very iridescent.

Hab. Chatahoochee river, near Columbia, Georgia, Dr. Boykin.

My cabinet.

Diam. .5,

Length .9,

Breadth 1.6 inches.

Shell smooth, elliptical, compressed before, very inequilateral, obtusely biangular behind; substance of the shell thin, thicker before; beaks a little prominent and placed near to the anterior margin; ligament rather long and thin; epidermis shining, black, with distant marks of growth; posterior slope rather compressed, and with an indented line from the beaks to the margin; umbonial slope inflated and rounded; cardinal teeth small, pointed, crenulate; lateral teeth long, curved and removed from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed above the centre of the cavity of the beaks; pallial cicatrix impressed; cavity of the shell rather deep; cavity of the beaks shallow and subangular; nacre white and beautifully iridescent.

Remarks.—A single specimen of this species was received by me some years ago, from my late friend, Dr. Boykin, to whose kindness I owe many interesting and new species from the fruitful locality of Columbia. Having never been able to obtain other specimens, I have delayed until now its description. Older or younger specimens may present different characters. This specimen is in good condition, but the beaks are not perfect, and in younger and perfect specimens, the epidermis may not be so dark as this. It is allied to *U. occultus*, (Nobis,) but is not so compressed nor so high in the carina. The *occultus* is also much more rayed.

UNIO NUX. Pl. XXIV. Fig. 43.

Testâ lævi, ellipticâ, convexâ, subinæquilaterali, posticè subangulatâ; valvulis percrassis; natibus prominentibus, rotundatis; epidermide tenebroso-fuscâ, radiatâ; dentibus cardinalibus subgrandibus; lateralibus brevis rectisque; margaritâ argenteâ et iridescente.

Shell smooth, elliptical, convex, somewhat inequilateral, subangular behind; valves very thick; beaks prominent, rounded; epidermis dark-brown, radiated; cardinal teeth rather large; lateral teeth short and straight; nacre very white and iridescent.

Hab. Alabama river, Mr. Wheatley.

My cabinet and cabinets of Dr. Budd and Mr. C. M. Wheatley, New York.

Diam. .6,

Length .8,

Breadth, 1.1 inches.

Shell smooth, elliptical, convex, somewhat inequilateral, rounded before, subangular behind; substance of the shell very thick, much thinner behind; beaks prominent, inflated towards the umbo; ligament very short and rather thick; epidermis dark-brown, obscurely radiated, yellow on the posterior slope, with a single curved ray from the beak to the

margin, marks of growth rather distant and distinct; umbonial slope obtusely angular; cardinal teeth rather large, double in the right and single in the left valve, crenulate, pointed; lateral teeth short and straight; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices small and placed on the under side of the plate between the cardinal and lateral teeth; cavity of the shell deep and rounded; cavity of the beaks rather deep and angular; nacre very white and very iridescent on the posterior portion of the valve.

Remarks.—There are three specimens before me of this small species. The largest is scarcely an inch wide, but may not be entirely mature. It looks somewhat like *U. decusus*, (Nobis,) but may be distinguished by its colour and by the place and form of the beak. It is not an oblique species, but in outline more like *U. glans*, (Nobis.) In the yellow colour of the posterior slope it resembles *U. ebenus*, (Nobis,) but it is not so rotund as that shell, and has the beaks more medial. The posterior portion of the valve is remarkably thin for so thick a species, and the nacre uncommonly pearly and iridescent.

UNIO NIGRINUS. Pl. XXIV. Fig. 44.

Testâ lævi, obovatâ, subinflatâ, inequilaterali, nigrâ; valvulis tenuibus; natibus subprominentibus; dentibus cardinalibus parvis, acuminatis; lateralibus longis curvisque; margaritâ subpurpureâ et iridescente.

Shell smooth, obovate, somewhat inflated, inequilateral, black; valves thin; beaks slightly prominent; cardinal teeth small, pointed; lateral teeth long and curved; nacre somewhat purple and iridescent.

Hab. West Florida, Major Le Conte.

Cabinet of Major Le Conte.

Diam. .7,

Length 1.1,

Breadth 1.9 inches.

Shell smooth, reversely ovate, somewhat inflated, inequilateral, rounded before and behind, black; substance of the shell thin; beaks slightly prominent and approaching the anterior margin; ligament short and very thin; epidermis smooth, somewhat shining, black, with very indistinct rays and approximate lines of growth; cardinal teeth small, double in both valves, pointed and more acuminate on the anterior division; lateral teeth long, thin and curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks shallow and slightly angular; nacre somewhat purple and very iridescent posteriorly.

Remarks.—A single specimen of this species, not very perfect, and eroded at the beaks, was among the West Florida shells from Major Le Conte. In outline, it approaches *U. amygdalum*, (Nobis,) but differs in being a larger shell, thinner, black on the outside and purple within. It is not so purple as the *U. cuprinus*, (Nobis,) nor is it so light in the epidermis. It is also nearly allied to *U. occultus*, (Nobis,) but is not so wide a species and is rounder on the umbonial slope.

ANODONTA DENIGRATA. Pl. XXV. Fig. 45.

Testâ lævi, ellipticâ, convexiusculâ, inæquilaterali, anticè rotundatâ; valvulis tenuibus; natibus prominulis, ad apices undulatis; epidermide politâ, bruneo-nigricente, obsolete radiatâ; margaritâ cæruleâ albâ et iridescente.

Shell smooth, elliptical, somewhat inflated, inequilateral, rounded before; valves thin, beaks slightly prominent, undulated at the tip; epidermis polished, blackish-brown, obscurely rayed; nacre bluish-white and iridescent.

Hab. Campbell county, East Tennessee, President Estabrook.

My cabinet and cabinet of President Estabrook.

Diam. .8, Length 1.2, Breadth 2.2 inches.

Shell smooth, elliptical, somewhat inflated, inequilateral, rounded before and very slightly flattened on the anterior part, with a slightly curved dorsal line a little irregular near the point of the beak; substance of the shell thin, very slightly thicker and whiter before; beaks very small and very slightly prominent, rather concentrically undulate at the tip; ligament thin and rather long; epidermis polished, blackish-brown, sometimes dark-greenish-brown, and obtusely rayed, with distant marks of growth. Posterior slope rather wide, and not much compressed; with three rather obscure dark-green rays, from the beak to the posterior margin; umbonial slope rounded and but slightly raised; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices immediately above the centre of the cavity of the beaks; cavity of the shell not very deep, oval; cavity of the beaks very shallow and rounded; nacre bluish-white and iridescent.

Remarks.—This is rather a small species, of which President Estabrook sent me some dozen specimens. It is a distinct species, and more nearly allied to *An. Ferussaciana*, (Nobis,) than to any other species. It differs in being a smaller species, in being more compressed, and in having a much less callus on the dorsal margin. Indeed, in some of the specimens no callus can be perceived. The undulations of the beaks are simple and nearly concentric, like the *Ferussaciana*, but they are smaller. In all the specimens but a half-grown one, there is a rough, opaque, white, carious mark of disease about the anterior cicatrix and the cavity of the beaks. The younger one is without this mark of disease. This specimen is greenish, and has the lines of growth very distinctly marked.

ANODONTA OPACA. Pl. XXV. Fig. 46.

Testâ lævi, ellipticâ, subinflatâ, inæquilaterali, posticè angulatâ; valvulis tenuibus; natibus subprominentibus, ad apices undulatis; epidermide opacâ, nigricente, obsolete radiatâ; margaritâ albâ et iridescente.

Shell smooth, elliptical, rather inflated, inequilateral, angular behind; valves thin, beaks rather prominent, undulate at the tip; epidermis dark, almost black, obscurely rayed; nacre white and iridescent.

Hab. Near New Orleans, Mons. Janin. Little Rock, Arkansas, Prof. Powell.

My cabinet and cabinets of Prof. Powell and Dr. Hale.

Diam. 1.5, Length 2.1, Breadth 3.4 inches.

Shell smooth, elliptical, rather inflated, inequilateral, angular behind, slightly curved on the dorsal line; substance of the shell thin; beaks rather prominent and undulated at the tip; ligament rather short and somewhat thick; epidermis dark, almost black, coarsely

striate, obscurely rayed, with distant lines of growth; posterior slope wide, very dark, and with obscure rays; umbonial slope very obscurely angular; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed anterior to the cavity of the beaks; pallear cicatrix scarcely perceptible; cavity of the shell rather deep and oval; cavity of the beaks rather shallow and rounded; nacre white and iridescent.

Remarks.—I have had several specimens of this species many years, and have had great difficulty where to place it. It is nearest allied to *An. fluviatilis*,—a species which has a most remarkably extended geographical range; but it seems to me to differ too much to retain it in that species. It differs in being less transverse, in the beaks being more medial, and in the epidermis being darker. It is also a little more enlarged on the umbonial slope. Being always very desirous to keep the number of our species as limited as possible, I very often defer for years describing specimens as new, which I cannot place satisfactorily with those already characterized. More recently, I have received from Prof. Powell several specimens of the same characteristics, from Little Rock, and I think it will be found by the naturalists of Louisiana and Arkansas, whence it comes, that the characters will be found constantly to differ enough to distinguish it from *fluviatilis*, which flourishes more than any other Anodonta in the middle states.

ANODONTA CALIFORNIENSIS. Pl. XXV. Fig. 47.

Testa subalatâ, lævi, ellipticâ, subinflatâ, posticè rotundatâ; valvulis tenuibus; natibus minutis, ad apices undulatis; epidermide virido-olivaceâ, nitidâ; margaritâ albâ et iridescente.

Shell subalate, smooth, elliptical, somewhat inflated, rounded behind; valves thin, beaks very small and undulated at the tips; epidermis olive-coloured, shining; nacre white and iridescent.

Hab. Rio Colorado, California, J. L. Le Conte, M. D.

My cabinet and cabinet of Major Le Conte.

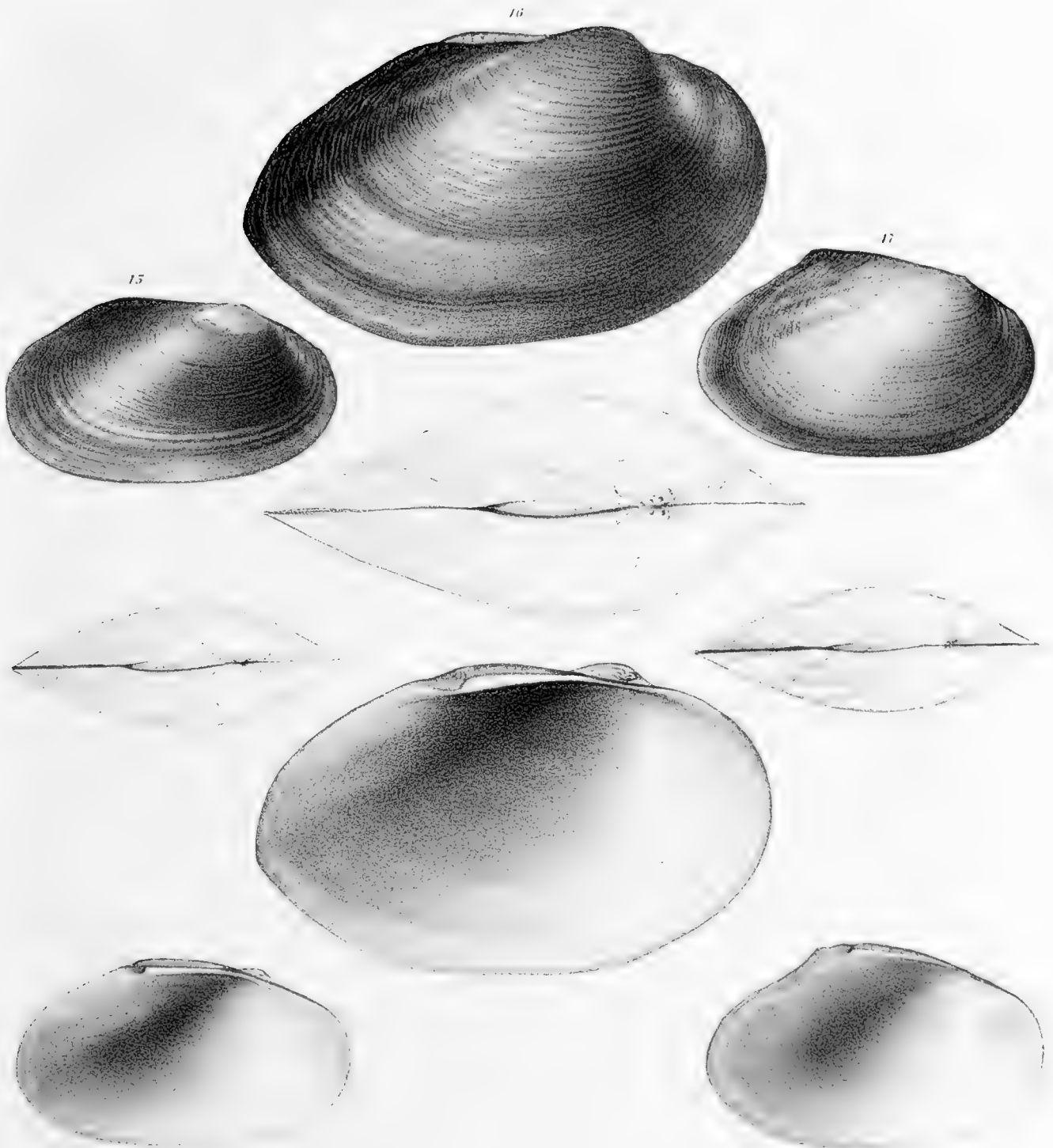
Diam. .8,

Length 1.3,

Breadth 2.2 inches.

Shell subalate, smooth, elliptical, somewhat inflated, rounded behind, slightly compressed towards the anterior basal margin; substance of the shell thin and fragile, beaks very small, scarcely rising above the dorsal line, finely undulate at the tip; ligament rather short and thin; epidermis virido-olivacea, shining, with rather distant marks of growth; posterior slope rather broad, compressed and raised nearly into a wing, with three distinct green rays from the beak to the margin; umbonial slope inflated and rounded; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices nearly in the centre of the beaks; pallear cicatrix scarcely visible; cavity of the shell rather deep; cavity of the beaks exceedingly shallow; nacre white.

Remarks.—Dr. Le Conte procured but two or three specimens of this, which was the only species of the family Naiades he saw in California. This marks a very singular difference in the existence of these forms of animal life, from those in the waters of the more eastern states, where they exist in such profusion, and in such a great number of various forms and habits. This species is more nearly allied, indeed it is closely allied to *An. Nuttalliana*, which I described many years since, and which was brought by Mr. Nuttall from



- 15 *Anodonta dentigrata*
 16 " *opaca*
 17 " *californiensis*.

Wahlamat river, in Oregon. It differs in being a smaller species, in being more inflated, and particularly so in the superior part. In this shell the umbonial slope is smaller from the beaks to the posterior dorsal margin. In the *Nuttalliana* the upper portion of the umbonial slope is flattened, but it enlarges towards the posterior basal margin, and there makes the greater diameter. In the *Californiensis* the greatest diameter is about the middle of the disk, and there is a marked difference in the wing, which is by no means so much elevated.

ANODONTA TRAUTWINIANA. Pl. XXVI. Fig. 48.

Testâ lævi, oblongâ, subinflatâ, inæquilaterali, e natibus lineatis; valvulis crassis; natibus prominulis, ad apices minutè undulatâ; epidermide virido-olivaceâ, rugoso-striatâ; margaritâ argenteâ et iridescente.

Shell smooth, oblong, somewhat inflated, inequilateral, with a line from the beaks; valves thick; beaks somewhat prominent, at the tips minutely undulated; epidermis greenish-olive and roughly striate; nacre silvery and iridescent.

Hab. Carthagera, South America, John C. Trautwine, Esq.

My cabinet and cabinet of the Academy of Natural Science.

Diam. .9,

Length 1.5,

Breadth 2.5 inches.

Shell smooth, oblong, somewhat inflated, inequilateral, obtusely rounded before, subulate behind, with a line from the beaks to the posterior margin; substance of the shell thick; beaks somewhat prominent, submedial, at the beaks very minutely undulated; ligament very long and thin, not protruding above the dorsal line of the valves; epidermis greenish-olive, and roughly striate, quite imbricate behind, without rays; umbonial slope elevated into a carina; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices none; pallial cicatrix slightly impressed; cavity of the shell rather deep and rounded; cavity of the beak very shallow and subangular; nacre silvery white, with minute striæ from the beaks towards the margin; iridescent.

Remarks.—The friends of Mr. Trautwine owe to him the possession of this interesting species, of which he brought many specimens, and liberally distributed them. It differs from any South American species which has come under my notice. It is a much smaller species than *An. trapezialis*, Lam., rougher in the epidermis and more oblong. Some of the specimens are somewhat greenish, others yellowish-olive. The triangular fosset at the end of the ligament, so usual in the South American *Naiades*, is very perceptible in this species.

In outline, it is allied to *tetragona*, (Nobis.)

ANODONTA WHEATLEYI. Pl. XXVI. Fig. 49.

Testâ lævi, transversâ, subinflatâ, gibbosâ, valdè inæquilaterali, posticè angulatâ, anticè irregulariter rotundatâ; valvulis crassis; natibus tumidis, parum elevatis, ferè terminalibus; epidermide cinnamomeâ, eradiatâ; margaritâ salmonis colore tinctâ et valdè iridescente.

Shell smooth, transverse, rather inflated, gibbous, very inequilateral, angular behind, irregularly rounded before; valves thick; beaks swollen, a little elevated and almost terminal; epidermis cinnamon-red and rayless; nacre salmon-coloured and very iridescent.

Hab. Para, South America, Mr. C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. .8,

Length 1.1,

Breadth 2.2 inches.

Shell smooth, transverse, rather inflated, gibbous, very inequilateral, angular behind, irregularly rounded before, slightly compressed near to the anterior margin and straight on the dorsal line; substance of the shell thick; beaks swollen, a little elevated and placed near to the anterior margin; ligament very long and very thin, scarcely protruding above the dorsal line; epidermis cinnamon-red, reddish-brown along the margin, totally without rays, the lines of growth approximate; posterior slope very long, rather wide, somewhat compressed, with a thin, coloured, elevated hair-like line passing from the beaks to the posterior margin; umbonial slope elevated and rounded; anterior cicatrices distinct, the smaller one very minute; posterior cicatrices confluent; no visible dorsal cicatrices; pal-leal cicatrices slightly impressed; cavity of shell rather shallow; cavity of the beaks rather shallow and subangular; nacre with minute striæ from the beaks towards the margin, of a beautiful light salmon colour, and magnificently iridescent.

Remarks.—Of this beautiful South American *Anodonta*, I have but a single specimen before me. It differs from any of the species described by Spix or D'Orbigny, and is altogether a very remarkable species. It is a stout shell, with a nacre which is softer, richer and more satin-like than in any I have ever seen. The nacre is a light salmon colour, with a tint of purple, which gives the most surprising softness and brilliancy to it. The margin is dark; but the nacre immediately in contact with it gives a line of fine blue and green. The triangular fosset at the end of the ligament, common to the South American species, is very marked in this.

I owe this and many other fine shells of this family to my friend Mr. Wheatley, and I dedicate this beautiful one to him.

ANODONTA SHAEFFERIANA. Pl. XXVI. Fig. 50.

Testâ lævi, oblongâ, inflatâ, inæquilateralî, posticè angulatâ; valvulis subcrassis; natibus prominentibus, ad apices undulatis; epidermide castaneâ, nitidâ, obsoletè radiatâ; margaritâ salmonis colore tinctâ.

Shell smooth, oblong, inflated, inequilateral, angular behind; valves rather thick; beaks somewhat prominent, undulated at the beaks; epidermis shining, chestnut-coloured and obsoletely rayed; nacre salmon coloured.

Hab. Horn Lake Creek, Tenn., Mr. Shaeffer.

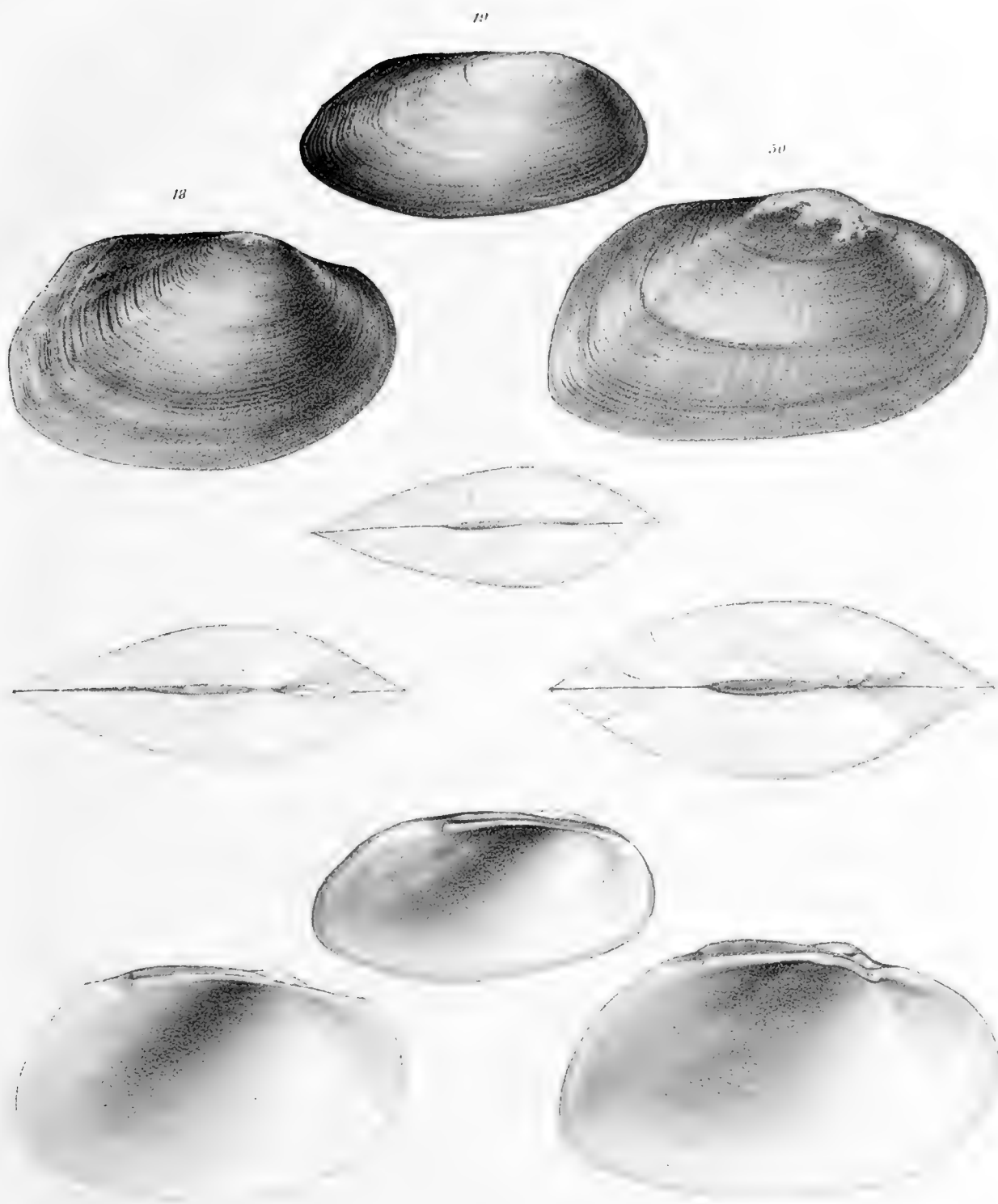
My cabinet and cabinet of Mr. Shaeffer.

Diam. 1.2,

Length 1.7,

Breadth 2.8 inches.

Shell smooth, oblong, inflated, inequilateral, angular behind, rounded before; dorsal line under the beak, interrupted by a double, tuberculous callus; substance of the shell thick; beaks somewhat prominent, submedial, coarsely undulated at the tip; ligament rather short and thick; epidermis shining, chestnut coloured, obsoletely rayed, with distinct distant marks of growth; posterior slope broad and somewhat flattened; umbonial slope angular from beak to margin; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed above the cavity of the beaks and partly on the tuberculate swellings; pal-leal cicatrix slightly impressed; cavity of the shell deep and broad; cavity of the beaks deep and subangular; nacre salmon-coloured and brilliant.



18 *Anodonta Troutwimaniana*.
 19 " *Wheatleyi*.
 50 " *Shaefferiana*.

Remarks.—This species is nearly allied to *A. tetragona*, (Nobis,) but seems to me too distinct to be considered the same. The outline is much the same, but the tuberculous swellings under the beak are more enlarged than in that species. The umbonial angle is also more sharp. There are two specimens before me, both of which have beautiful salmon-coloured nacre. A third specimen, also from Mr. Shaeffer, marked “Missouri,” is somewhat like the others, but approaches more to some of the varieties of *areolatus*, Swain.*

I owe this and several other fine shells to Mr. Shaeffer, an ardent collector of Cincinnati, and I name this one after him.

ANODONTA LINNÆNA. Pl. XXVII. Fig. 51.

Testâ lævi, rotundatâ, valdè inflatâ, subæquilaterali, posticè obtusè angulatâ; valvulis subtenuibus; natibus prominentibus, ad apices rugoso-undulatis; epidermide luteo-viridi, nitidâ, striatâ, obsolete radiatâ; margaritâ salmonis colore tinctâ et iridescente.

Shell smooth, rotund, very much inflated, nearly equilateral, obtusely angular behind; valves rather thin; beaks prominent and rugosely undulate at the tip; epidermis yellowish-green, shining, striate, obscurely rayed; nacre salmon-coloured and iridescent.

Hab. Lake Concordia, Louisiana, Mr. C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. 1.9, Length 2.8, Breadth 4.1 inches.

Shell smooth, rotund, much inflated, nearly equilateral, obtusely angular behind; very much inflated and rounded at the umbones, curved on the dorsal line; substance of the shell rather thin; beaks prominent, inflated, and rugosely wrinkled at the tip; ligament rather short and somewhat thick; epidermis yellowish-green, shining, rather roughly striate, obscurely rayed and very dark on the posterior slope; posterior slope broad, short, rather flattened, and very rugose; umbonial slope angular; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed near to the edge, some distance anterior to the point of the beaks; pallear cicatrix scarcely visible; cavity of the shell very deep and rounded; cavity of the beaks deep and rounded; nacre beautifully salmon-coloured, rich, and iridescent, leaving a very broad border round the margin.

Remarks.—This is the finest species of *Anodonta* I have seen from our country. It is most beautifully coloured in the nacre, which is exceedingly brilliant. A single specimen only is before me, and this is somewhat fractured. The margin is very uncommonly broad, without any pearly nacre, and white. The epidermis is rough with striæ, and yet it looks rich and pleasing. The green rays are broad and iridescent. This species is allied to *An. globosa*, (Nobis,) from Mexico; but it differs much in the smoothness and polish which the latter shell has. The beaks are more medial and the margin

* When in Cincinnati, nearly two years since, Mr. J. Clarke gave me a suite of a species of *Anodonta* which he considers to be the true *edentula* of Mr. Say, described in “The Disseminator.” They were taken from the river Ohio, near that city, and are not found in Mill Creek, near by, where the *areolatus* abounds. He says that they differ in the beaks, and in the outline they appear to me to differ very much,—the Ohio shell being very wide and oblong, while the Mill Creek shell is oval, and usually larger. The latter is also more rayed.

much broader. In colour they are entirely different. One is white, the other salmon-coloured. The fosset at the end of the ligament is remarkably large and curved.

This beautiful species I dedicate to the memory of the great master in natural science, *Linnæus*.

ANODONTA OBLITA. Pl. XXVIII. Fig. 52.

Testâ lævi, ellipticâ, compressâ, inæquilaterali, posticè subbiangulatâ; valvulis pertenuibus; natibus prominulis, ad apices undulatis; epidermide nitidâ, bruneo-viridi, obsoletè radiatâ; margaritâ cæruleâ albâ et iridescente.

Shell smooth, elliptical, compressed, inequilateral, subbiangular behind; valves very thin; beaks slightly prominent, undulated at the tip; epidermis shining, brownish-green, obscurely radiated; nacre bluish-white and iridescent.

Hab. Campbell county, East Tennessee, President Estabrook.

My cabinet and cabinet of President Estabrook.

Diam. .7,

Length 1.2,

Breadth 2 inches.

Shell smooth, elliptical, compressed, inequilateral, subbiangular behind, rounded before and slightly flattened on the anterior portion of the disk, with a simple curved dorsal line; substance of the shell very thin; beaks very small, slightly prominent and undulate at the tip; ligament rather thin and not very long; epidermis shining, brownish-green, obscurely rayed, with rather distant marks of growth; posterior slope rather narrow and somewhat compressed, with three distinct and somewhat distant green rays from the beaks to the posterior margin; umbonial slope rounded and considerably raised; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices on the inside of the dorsal line; cavity of the shell very shallow; cavity of the beaks very shallow; nacre bluish-white and iridescent.

Remarks.—I received but three specimens from President Estabrook of this species. The largest, although small, seems to be adult. The green colour of the posterior portion of the valve is dark and fine. There are here three rather broad and unusually distinct rays, the inferior one being the largest, and well over the umbonial slope. The anterior portion of the disk is darker and brownish. This species is perhaps the nearest allied to *An. denigrata*, herein described. It may be distinguished by its being more compressed, greener and smaller.

ANODONTA VIRENS. Pl. XXVIII. Fig. 53.

Testâ lævi, ellipticâ, ventricossissimâ, inæquilaterali, posticè subangulatâ; valvulis tenuibus; natibus prominentibus, valdè tumidis, ad apices rugoso-undulatis; epidermide viridi, politâ, obsoletè radiatâ; margaritâ albâ et iridescente.

Shell smooth, elliptical, very much inflated, inequilateral, subangular behind; valves thin; beaks prominent, very much swollen and rugosely undulate at the tip; epidermis green, polished, obscurely radiated; nacre white and iridescent.

Hab. Red river, at Alexandria, Louisiana, J. Hale, M. D.

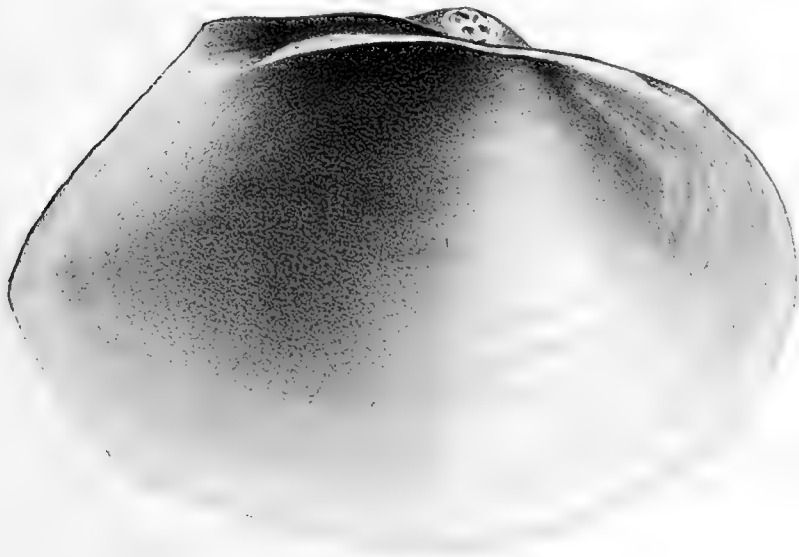
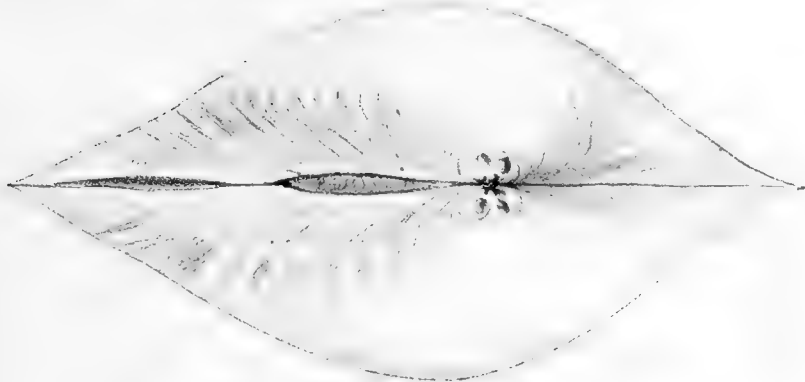
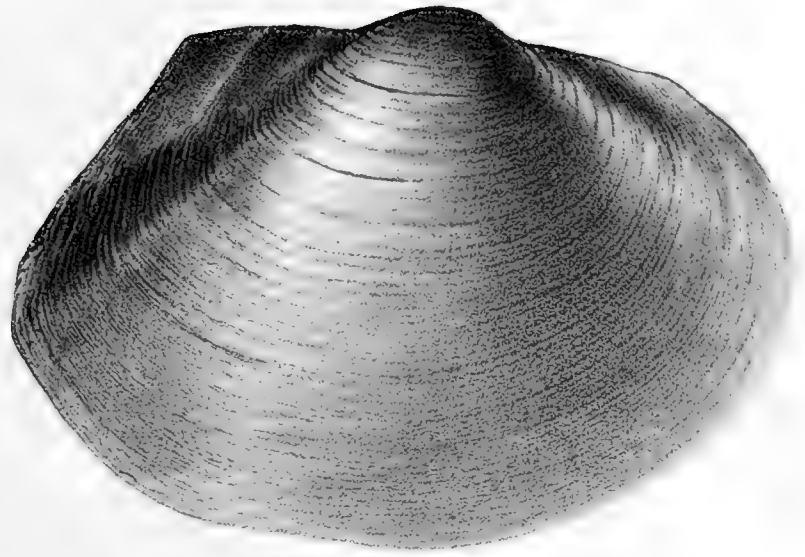
My cabinet and cabinet of Dr. Hale.

Diam. 1.9,

Length 2.3,

Breadth 3.5 inches.

51.



51 Anodonta limosa

Shell smooth, elliptical, very much inflated, inequilateral, subangular behind, angular at the anterior dorsal margin, very much inflated and somewhat gibbous on the umbones, nearly straight on the dorsal line; substance of the shell thin; beaks prominent, very much swollen and rugosely wrinkled at the tip; ligament rather short and somewhat thick; epidermis green, polished, slightly striate, obscurely rayed, with three rather obscure rays on the posterior slope, and with distant marks of growth; posterior slope very wide, rather short, and rather depressed; umbonial slope rounded, with an irregular, slightly raised line from the beaks to the posterior margin; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices invisible; pallial cicatrix not observable; cavity of the shell very deep and rounded; cavity of the beaks deep and rounded; nacre white and iridescent.

Remarks.—Several specimens are before me, of different ages. It is perhaps most nearly allied to *An. Stewartiana*, (Nobis,) but is more rotund, more inflated and smoother on the epidermis. In some of its characteristics, it approaches the *An. Linnaeana*, (Nobis,) described in this paper. It differs from that in being less rotund, in having a smoother and more polished epidermis, and it differs entirely in the nacre, which is not salmon-coloured, nor so thick or brilliant.

ANODONTA TORTILIS. Pl. XXVIII. Fig. 54.

Testa plicatâ, obovatâ, subcompressâ, inæquilaterali, è natibus minutè lineatis; valvulis subtenuibus; natibus prominulis; epidermide olivaceâ, minutè tortile; margaritâ cæruleo-albâ et iridescente.

Shell plicate, obovate, somewhat compressed, inequilateral, minutely lined from the beaks; beaks a little prominent; valves rather thin; epidermis olive, minutely wreathed; nacre bluish-white and iridescent.

Hab. Carthagenâ, South America, J. C. Trautwine, Esq.

My cabinet.

Diam. .5,

Length .9,

Breadth 1.4 inches.

Shell plicate, obovate, somewhat compressed, inequilateral, rather obtusely rounded before and subulate behind, with a minute line from the beaks to the posterior margin; substance of the shell rather thin; beaks a little prominent, submedial; ligament rather long and thin; epidermis olive, minutely wreathed nearly over the whole disk, without rays; umbonial slope compressed and elevated into a carina; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices none; cavity of the shell rather shallow; cavity of the beaks very shallow and subangular; nacre bluish-white, iridescent, with minute striæ from the beaks to the margin.

Remarks.—It is to be regretted that only a single specimen of this shell should have been found by Mr. Trautwine, to whose kindness I owe the possession of it. It is remarkable for the minute wreaths of the epidermis, which are distributed in festoons over most of the disk. In these wreaths it resembles the *An. crispata*, Lam., which is the only species of the family I have seen with this singular character. The specimen before me has the beaks beautifully tinged with a greenish hue, being epidermal matter deposited between the layers of nacreous matter. In the cavity of the beaks this shows quite conspicuously, and is stronger in two divergent lines. Under the lens, in this specimen, a

number of minute impressions may be observed in both valves, posterior to the anterior cicatrix. Whether these are muscular attachments or not I am not certain; older and thicker specimens would enable one to judge. It has the triangular fosset common to the South American species. The margin is broad for the size of the shell, and the granules of it are very perceptible with a microscope of good power.

This species comes so near in its characters to the *An. crispata*, my specimen of which came from Cayenne, that it is with some hesitation that I have separated it. The *tortilis* has the festooned crimples much finer, and they do not extend over the whole disk, as in the *crispata*, nor are they by any means so much impressed, but change into striæ on the posterior slope and on the anterior portion of the disk. The *tortilis* is also rather longer and more compressed towards the beaks. On the *crispata* the festooned crimples are much coarser, and the marks of growth are different. Dr. Gould, in the Proceedings of the Boston Society of Natural History, November, 1850, described an *Anodonta*, under the name of *glauca*, brought by the Exploring Expedition, which I believed at the time to be the *crispata*, Lam. The specimen seemed to me to be of the same species with that which I procured from Ferussac, in Paris, under the name of *crispata*. The name of *glauca* also is preoccupied by Valenciennes, for another *Anodonta* from South America. It is with some hesitation I place this in the division of "plicate" species, as it almost requires a lens to see the folds, but it cannot be called a "smooth" shell.

ANODONTA SCHRÖTERIANA. Pl. XXIX. Fig. 55.

" *Testâ lævi, transversâ, subcompressâ, valdè inæquilaterali, posticè obtuso-biangulari; valvulis subcrassis; natibus prominentibus, acutis; epidermide rugosâ, creberrimè striatâ, tenebroso-olivâ, obsolete radiatâ; margaritâ albâ et iridescente.*

Shell smooth, transverse, rather compressed, very inequilateral, obtusely angular behind; valves rather thick; beaks prominent and pointed; epidermis rough, thickly striated, dark-olive, indistinctly radiated; nacre white and iridescent.

Hab. Rio Negro, Brazil, Mr. C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. .9,

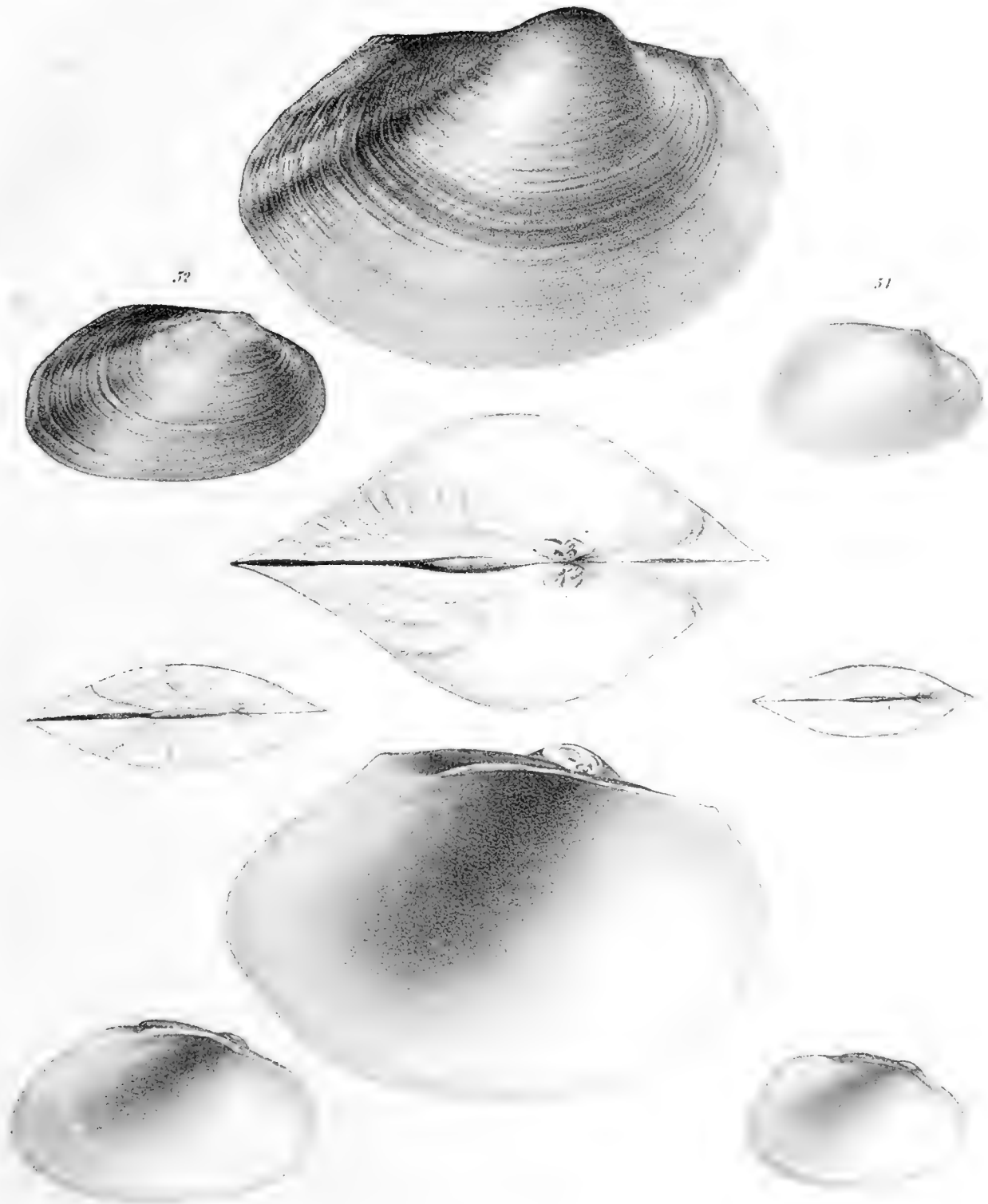
Length 1.5,

Breadth, 3.1 inches.

Shell smooth, transverse, rather compressed, very inequilateral, obtusely biangular behind, slightly compressed on the sides near the middle of the dorsal line, with a slight callus under the beaks; substance of the shell rather thick; beaks prominent, pointed and placed towards the anterior margin; ligament long and rather thin; epidermis very rough, covered with very close crimped striæ, dark-olive, with a few indistinct rays over the posterior slope, and with rather distant lines of growth; posterior slope long, compressed into a carina; umbonial slope slightly raised and rounded; anterior cicatrices distinct, the smaller one very minute; posterior cicatrices confluent; no visible dorsal cicatrices; pal-leal cicatrices slightly impressed; cavity of the shell rather shallow and wide; cavity of the beaks shallow and angular; nacre with minute striæ from the beaks towards the margin, white and iridescent.

Remarks.—A single specimen, or rather the two valves of different individuals, was kindly given to me by Mr. Wheatley. It does not seem to have been noticed by Spix or

53



52 *Anadonta oblita*
 53 " *virans*
 54 " *tortilis*.

by D'Orbigny. It is very peculiar in the texture of the epidermis, which is crimped up into irregular, somewhat parallel, very close, rugose lines, which cover the whole surface of the disk. In both of these valves there is a distinct muscular impression above the great anterior cicatrix, which I have not observed before in any of the *Anodontæ*. The absence of a dorsal cicatrix is also unusual; but in this it resembles some of the other South American species, viz.: *Anodonta ensiformis*, Spix, *soleniformis*, D'Orb, &c. In outline it is nearly allied to *An. exilis*, (Nobis,) but it has not the straight dorsal line, is a thicker shell, and has a very different epidermis. The triangular fosset at the end of the ligament is rather large and well marked. The right valve has a few black pencilled marks in the nacre, such as are sometimes seen in the South American *Anodontæ*. These are remarkable as being nearly parallel, and in a direction pointing to the beaks. They look as if made by a pen, with black ink.

I name this fine species in honour of the memory of Schröster, author of *Flusconchlien*, &c.

ANODONTA ARKANSENSIS. Pl. XXIX. Fig. 56.

Testâ lævi, ellipticâ, compressâ, valdè inæquilaterali, posticè subbiangulatâ; valvulis crassis; natibus subprominentibus, ad apices undulatis; epidermide subviridi, radiatâ, striatâ; margaritâ cæruleo-albâ.

Shell smooth, elliptical, compressed, very inequilateral, subbiangular behind; valves thick; beaks rather prominent and undulated at the tip; epidermis greenish, rayed; nacre bluish-white.

Hab. Little Arkansas, J. L. Le Conte, M. D.

Cabinet of Major Le Conte.

Diam. .9,

Length 1.7,

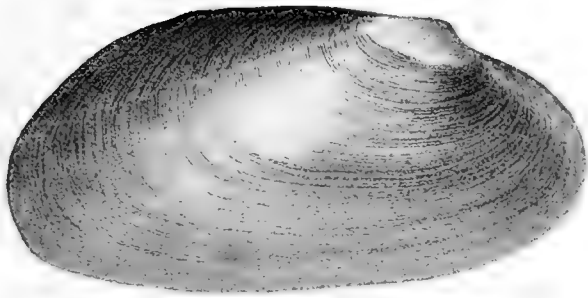
Breadth 3 inches.

Shell smooth, elliptical, compressed, subbiangular behind and rounded before, subangular on the posterior slope; substance of the shell thick; beaks rather prominent, pointed, with three or four large undulations at the tip; ligament long and rather thin; epidermis greenish, striate, with unequal transverse marks of growth, dark on the posterior slope, with indistinct, broad greenish rays over the disk; posterior slope with two lines from the beak to the posterior margin; dorsal margin slightly curved, and having a callus immediately under the beak almost amounting to a tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the lower part of the callus; cavity of the shell rather shallow; cavity of the beaks shallow and angular; nacre bluish-white, leaving a broad dark margin.

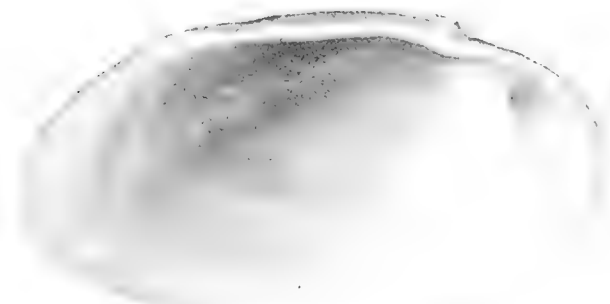
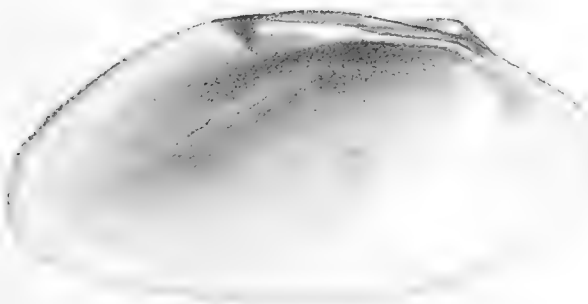
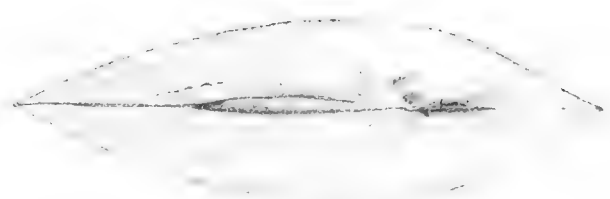
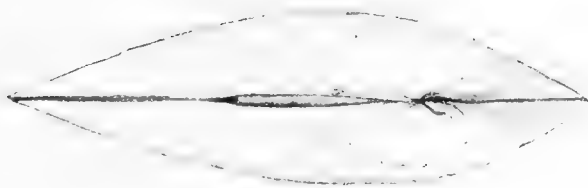
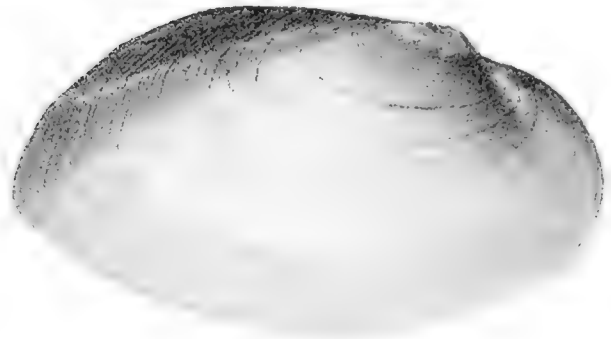
Remarks.—A single specimen of this interesting species has been submitted to me by Dr. J. L. Le Conte, who obtained it on a late scientific excursion to the Rocky Mountains, from the Little Arkansas, where the road to Santa Fé crosses it. This species is not likely to be confounded with any other known to me, and belongs to that group which has an irregular thickening or callus under the beak on the dorsal margin, which, while it does not amount to a tooth, makes a very distinct natural group. This callus is not so large and marked as to be confounded with D'Orbigny's genus *Monocondylæa*; but it may be compared with that of *Alusmodonta edentula*, Say, which is a true *Anodonta*. The form of this species is more lenticular than in any other of the genus I know; and look-

ing on the exterior reminds us of *Symphynota compressa*, (Nobis,) changed to *U. pressus*, (Nobis.) The undulations of the beaks are large, and the epidermis of them being thin, gives the tip a whitish appearance.

55



56



55 *Anodonta schroeteriana*.

56 " *Arkansensis*.

From notes by Watson

See also Pl. 30

DESCRIPTION OF A NEW GENUS (BASISTOMA,) OF THE FAMILY MELANIANA,

TOGETHER WITH

SOME NEW SPECIES OF AMERICAN MELANIÆ.

FAMILY MELANIANA.

GENUS BASISTOMA.*

Testa conica. Apertura ovata, basi abscissa. Labrum acutum. Columella lævi. Operculum —.

THE particular shell for which I propose this genus was given to me by Amory Edwards, Esq., late the Consul of the United States at Rio, who brought it from four hundred miles up the river Tocatinus, five hundred miles distant from the ocean, at the mouth of the Amazon. It differs from any of the family of *Melania* in the cut at the base, and it has none at the superior part of the aperture. It comes near to *Pirena*, but wants the superior cut, and it differs from *Melanopsis* in its general form as well as in having no callus on the columella. The *Melania* being so enormously developed, and having but few genera, I think it advisable to constitute new ones, whenever a group can be well characterized, which is the case with this form. I think that *Melania transversa*, (Nobis,) from Guiana, and *M. Braziliensis*, (Nobis,) would properly come under this division, and very likely other characteristic species will be found in that portion of South America whence these three come. The genus *Melatoma*, Swainson, is a well characterized group in some respects near to this. While it is emarginate at base, it has an emargination also towards the upper portion of the outer lip, and the group, as far as I know it, has a general and well characterized outline, being somewhat mitraform. I think that my *M. microstoma*, *tornatella* and *rudis* all belong to a group which would constitute a new genus, unless it could be put into one of Mr. Swainson's genera, all the types of which I have not seen.

* *βασις*, base, and *τεμνω*, to cut.

When I proposed the name of *Schizostoma* for a genus of *Melania* with a cut at the superior portion of the aperture, I was not aware that M. Bronn had already used that name for a fossil genus. I now propose to substitute *Schizochilus*, from *σχιζω*, to cut, and *χίλος*, lip.

I very much regret that the operculum did not accompany this specimen, suspecting, as I do, that it will be found to differ from the genus *Melania*, and be somewhat like *M. transversa*, which I propose above to bring into this group. The operculum of this latter species was described by me as having the polar point near the centre, and having five revolutions.*

BASISTOMA EDWARDSII. Pl. XXX. Fig. 1.

Testâ striatâ, turritâ, subcrassâ, geniculatâ, tenebroso-corneâ; spirâ valdè attenuatâ; suturis valdè impressis; anfractibus planulatis; supernè impressis, lineis creberrimis instructis; aperturâ subgrandi, ellipticâ, intus albidâ, ad basim valdè abscissâ; columellâ lævi tortâque.

Shell striate, turreted, rather thick, geniculate, dark horn-colour; spire very much drawn out; sutures very much impressed; whorls flattened, impressed above, thickly covered with revolving lines; aperture rather large, elliptical, white within, at the base abruptly cut off; columella smooth and twisted.

Hab. River Tocatinus, South America, Amory Edwards, Esq.

My cabinet.

Diam. .50,

Length 1.92, of an inch.

Remarks.—This very beautiful and interesting shell is remarkable for the new form it presents in the aperture. It is thickly striate all over the whorls, and looks like a succession of coils of rope piled on each other. The two lower whorls are impressed above the middle, which gives it a geniculate character immediately below the suture. Between the striæ there are very minute sculptured points. The apex being eroded, the number of whorls are not ascertainable, but they are probably about ten. The outer lip is very sharply edged, and the central portion very much extended on a curve. The aperture is about one-fourth the length of the shell.

The form of this species reminds one of *Achatina columna* (*Lymnea columnaris*, Lamarck,) which is however, a land shell. It is drawn out like it and has flattened sides, with a cut at the base of nearly the same form. In other characters they are not at all alike, the *columna* being sinistral, covered with granules, much larger and belonging to a different genus altogether.

I dedicate this fine species to my friend Mr. Edwards, to whom I am indebted for it and many other interesting shells from the waters and banks of the Amazon.

MELANIA PERSTRIATA. Pl. XXX. Fig. 2.

Testâ striatâ, acuto-conoideâ, subtenui, cinnamomeo-bruneâ; spirâ elevatâ, subattenuatâ, ad apicè carinatâ et granulatâ; suturis impressis; anfractibus septenis, convexis; aperturâ parvâ, ellipticâ, ad basim angulatâ, intus rufâ; columellâ lævi.

Shell striate, acutely conical, rather thin, cinnamon-brown; spire elevated, somewhat attenuate, at the apex carinate and granulate; sutures impressed, whorls seven, convex; aperture small, elliptical, angular at the base, reddish within; columella smooth.

* Proceedings Zoological Soc., London, 1851, p. 187.

Hab. Coosa river, Alabama, Prof. Brumby. Huntsville, Tenn., Mr. J. Clark. Tennessee, Prof. Troost.

My cabinet and cabinets of Prof. Brumby and Mr. Clarke.

Diam. .28,

Length .83, of an inch.

Remarks.—Among the numerous *Melaniæ* sent to me long since by my late friend Prof. Troost, were several specimens of the young of this species. I could not satisfactorily place them in any known species, and I put them temporarily with *striatula*, (Nobis,) which is strongly allied to the species which I have described above. Recently, I have received from Prof. Brumby and from Mr. J. Clark several adult specimens, which leave the younger in my possession no longer in doubt,—they were recognised at once to belong to those more recently received. All the specimens—some dozen—before me are reddish; the *striatula* is horn-coloured, with a white aperture. The latter is also flatter in the whorls, and not so carinate above, nor are the sutures so deeply impressed. Some of the specimens are quite smooth on the body whorl. Aperture about one-third the length of the shell.

MELANIA SCULPTILIS. Pl. XXX. Fig. 3.

Testâ perstriatâ, conoideâ, subtenui, corneâ; spirâ acuminatâ, ad apicem carinatâ et granulatâ; suturis irregulariter impressis; anfractibus decim, subplanulatis; striis crebris et inter sculpturatâ; aperturâ parvâ, ellipticâ, ad basim angulatâ, intus albidâ; columellâ incurvâ tortâque.

Shell thickly striate, conical, rather thin, horn colour; spire pointed, towards the apex carinate and granulate; sutures irregularly impressed; whorls ten, rather flattened; striæ close, and between them sculptured; aperture small, elliptical, angular at base, white within; columella incurved and twisted.

Hab. Tennessee, Mr. J. Clark.

My cabinet and cabinet of Mr. Clark.

Diam. .24,

Length .55, of an inch.

Remarks.—Two specimens are before me, which are precisely alike. It is a very remarkable species, having regular and close striæ over the whole of the lower whorls, between which striæ there is a double row of minute indented marks, very close to each other, and only visible with a lens. I have seen no such marks on any other species. In outline it is closely allied to *striatula*, (Nobis,) but it is a smaller species, and has not the cancellation of that species. The aperture is rather more than one-third the length of the shell. The outer lip is broken.

MELANIA CLARKII. Pl. XXX. Fig. 4.

Testâ plicatâ, claviformis, subtenui, tenebroso-fuscâ; spirâ elevatâ, attenuatâ; suturis subimpressis; anfractibus planulatis; aperturâ parvâ, subellipticâ, ad basim angulatâ, intus tenebrôsâ; columellâ tortâ.

Shell folded, club-shaped, rather thin, dark-brown; spire elevated, drawn out; sutures somewhat impressed; whorls flattened; aperture small, rather elliptical, at the base angular, within dark; columella twisted.

Hab. Duck Creek, Tenn., Mr. Joseph Clark.

My cabinet and cabinet of Mr. Clark.

Diam. .23,

Length .73, of an inch.

Remarks.—The form of this species is more attenuate than usual with the clavate forms. It has about ten whorls; those above the body whorl being disposed to be both plicate and striate. Towards the apex they are all thickly striate. On all the specimens before me, on the lower whorls, there are irregular oblique striæ, somewhat similar to those on the *M. Ocoeënsis*, (Nobis,) which give them a malleate character. On the upper margin of the whorls, along the sutures, there is usually an indistinct light line. The outer lip is broken.

MELANIA BRUMBYI. Pl. XXX. Fig. 5.

Testâ striatâ, pyramidatâ, subcrassâ, rufo-bruneâ; spirâ valdè elevatâ, ad apicè carinatâ; suturis vix impressis; anfractibus planulatis; aperturâ subgrandi, rhomboideâ, intus rubiginosâ; columellâ tortâ.

Shell striate, pyramidal, rather thick, reddish-brown; spire very much elevated, carinate at the apex; sutures but slightly impressed; whorls flattened; aperture rather large, rhomboidal, within rubiginose; columella twisted.

Hab. Coosa river, Alabama, Prof. Brumby. Huntsville, Alabama, Mr. J. Clark.

My cabinet and cabinets of Prof. Brumby and Mr. Clark.

Diam. .53,

Length 1.72, of an inch.

Remarks.—This is a very remarkable species, and among the largest of our *Melaniæ*. In form and size it is allied to *annulifera*, Con., but may easily be distinguished by its more numerous striæ, its reddish colour, and the form of its aperture, which is more open. In the *Brumbyi* there is an angle in the middle of the whorl, which gives the aperture a rhomboidal form. The columella is rufous and the channel whitish. The apex of each of them being broken, the number of whorls cannot be correctly ascertained. I should suppose there were at least ten. Some of the specimens here are beautifully granulate between the striæ. The aperture is not quite one-fourth the length of the shell. Along the suture, on the upper part of the whorl, there is a line of a lighter colour than the other part.

I dedicate this species to Prof. R. T. Brumby, who has done so much in bringing to light the interesting shells of Alabama.

MELANIA OBLITA. Pl. XXX. Fig. 6.

Testâ valdè carinatâ, turritâ, cochleæformis, subtenui, corneâ; spirâ attenuatâ; suturis linearibus; anfractibus duodecim, acutè carinatâ; aperturâ parvâ, ellipticâ, intus albidâ; columellâ albâ tortâque.

Shell very much carinated, turreted, screw-shaped, rather thin, horn-coloured; spire drawn out; sutures linear; whorls twelve, acutely carinate; aperture small, elliptical, within whitish; columella white and twisted.

Hab. Tennessee?

My cabinet.

Diam. .30,

Length .96, of an inch.

Remarks.—I have about a dozen of this species, which is very distinct from any with which I am acquainted. The locality I am uncertain about, the label being by some accident lost. I believe it comes from Tennessee, but am not certain. Its very marked character of a screw, or rather the end of a gimlet, strikes one at once. In most species there is a thread-like line above the carina and several below. The carina

is not usually persistent on the body whorl. It is nearest in form and size to *M. percarinata*, Con., but may be easily distinguished by the absence of granules between the carinæ, the length of the spire, having three or four more whorls, and in being less shining. The aperture is not quite one-third the length of the shell.

MELANIA FURVA. Pl. XXX. Fig. 7.

Testâ lævi, conoideâ, subcrassâ furvâ; spirâ subelevatâ; suturis excavatis; anfractibus planulatis; aperturâ parvâ, subrhomboidêâ, ad basim angulatâ, intus purpureâ; columellâ purpureâ tortâque.

Shell smooth, conical, rather thick, dusky; spire rather elevated; sutures furrowed; whorls flattened; aperture small, subrhomboidal, at the base angular, within purplish; columella purple and twisted.

Hab. Branch of Coosa River, Alabama, Prof. Brumby.

My cabinet and cabinet of Prof. Brumby.

Diam. .30,

Length .84, of an inch.

Remarks.—A single specimen of this species was received from Prof. Brumby. It has the apex so much eroded as to present only a little more than three whorls, which are, however, perfect, and enable me to distinguish it from its allied species, the nearest of which is *M. arata*, (Nobis.) The sutures have the same furrowed line, and the sides of the whorl are alike flattened. The aperture, however, differs in form and colour. In the *arata* the columella is straight down to the channel at the base; in the *furva*, it is curved to the right and the channel is less marked. The length of the aperture, in perfect specimens, must be about one-third the length of the shell.

The *Alexandrensis*, (Nobis,) from Louisiana, is very closely allied to this species, and when perfect specimens of both shall be obtained, they may possibly be found to be the same.

MELANIA SELLERSIANA. Pl. XXX. Fig. 8.

Testâ plicatâ, parvâ, conoidêâ, subcrassâ, bruneo-nigricente; spirâ subbrevis; suturis linearibus; anfractibus subconvexis; aperturâ magnâ, ellipticâ, ad basim rotundatâ, intus purpureâ; columellâ valdè incurvatâ.

Shell folded, small, conical, rather thick, very dark-brown; spire rather short; sutures linear; whorls slightly convex; aperture large, elliptical, rounded at the base, within purple; columella very much incurved.

Hab. Cany Fork, Tennessee, Mr. Coleman Sellers.

My cabinet and cabinets of Mr. Sellers and Mr. Anthony.

Diam. .16,

Length .38, of an inch.

Remarks.—This is an interesting little species, somewhat like *M. Nickliniana*, (Nobis,) in its general appearance and size, but is less inflated, and of a darker colour. It might be supposed that its being a plicate shell would at once distinguish it; but the *Sellersiana* seems to be very variable in the character of its folds, some of the specimens really having none remaining. These may have had folds near the apex, which is now eroded. Some of those before me are beautifully folded down to the last half of the body whorl, the folds being rather large and straight. The surface varies very much; some of the specimens being beautifully malleate, while on others no such marks can be observed. The outer lip is broken.

The apex being eroded in all the specimens, I am not sure of the number of the whorls; there may be about six. The aperture is about one-half the length of the shell.

I dedicate this species to Mr. Coleman Sellers, of Cincinnati.

MELANIA OPPUGNATA. Pl. XXX. Fig. 9.

Testâ lævi, truncatâ, cylindraceâ, percrassâ, luteo-corneâ; spirâ truncatâ; suturis magnis et valdè irregulariter impressis; anfractibus valdè compressis, supernè geniculatis; aperturâ prælongâ, valdè constrictâ, supernè callosâ, intus albâ; columellâ tortâ, supernè valdè incrassatâ.

Shell smooth, truncate, cylindrical, very thick, yellowish horn-colour; spire cut off; sutures large and very irregularly impressed; whorls very much compressed, geniculate above; aperture very long, very much narrowed, above callous, within white; columella twisted; and very much thickened above.

Hab. Alabama river, Mr. C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. .41,

Length — ?

Remarks.—This is a very remarkable species. The two specimens before me are both cut off, leaving little more than the body whorl. When taken they were evidently living and healthy specimens, but the eroded and fractured spires give them the appearance of old and diseased shells, which is by no means the case. The upper part of the whorl, along the suture, is irregularly fractured round the whole circle. This arises from the fact that the animal having filled up the channel with calcareous deposit, suddenly recommences at a new line of growth, some distance below, leaving open and bare of epidermal matter this upper portion of the channel, which consequently having a sharp edge, becomes more or less fractured. The whorls are so much flattened that the two sides are nearly parallel. One of the specimens has a small spot of brown in the aperture above and below—the other has none. This species is allied to *auriculaformis*, (Nobis,) on one side, and *olivula*, Con., on the other, but it may be easily distinguished from both of them. The former is a smaller shell and more fusiform; the latter is more conical, less thickened on the columella, and not irregularly fractured in the suture. The number of whorls or proportional size of the aperture cannot be ascertained on the specimens before me. They have the appearance of having been very much exposed to an attacking enemy, hence the name.

MELANIA SAFFORDII. Pl. XXX. Fig. 10.

Testâ lævi, obtuso-conoideâ, crassâ, subfusiformis, tenebroso-viridi; spirâ subbrevis; suturis linearibus; anfractibus convexiusculus, ultimo magno; aperturâ subgrandi, ovato-productâ, intus purpureâ; columellâ purpureâ tortâque.

Shell smooth, obtusely conical, thick, subfusiform, dark-green; spire rather short; sutures linear; whorls a little convex, the last large; aperture rather large, ovately elongated, within purple; columella purple and twisted.

Hab. Lebanon, Wilson county, Tennessee, Mr. James M. Safford.

My cabinet and cabinet of Mr. Safford.

Diam. .37

Length .85, of an inch.

Remarks.—This is a very distinct species, with a not uncommon form. The green colour is unusual. On the upper part of the whorl, and on the line of the suture there is a light or brownish band. The body whorl is rather suddenly enlarged in the middle, which gives it a slight gibbous appearance, and it is irregularly transversely striate. The apex of each of the three specimens under my examination being eroded, the number of whorls cannot be exactly ascertained, but I think there must be about six. The aperture is quite one-half the length of the shell. It is allied to *M. sordida*, (Nobis,) in outline, but may easily be distinguished in colour and the gibbous swelling on the whorls. I name this after Mr. Safford, to whose kindness I owe this and some other fine specimens from Tennessee.

MELANIA PINGUIS. Pl. XXX. Fig. 11.

Testâ lævi, inflatâ, subrotundâ, percrassâ, tenebroso-fuscâ; spirâ obtuso-conoideâ; suturis impressis; anfractibus convexiusculus; aperturâ magnâ, rotundatâ, intus vel albâ vel purpureâ; columellâ incurvâ, incrassatâ.

Shell smooth, inflated, almost round, very thick, dark-brown; spire very obtusely conical; sutures impressed; whorls a little convex; aperture very large and rounded, within either white or purple; columella incurved and thickened.

Hab. Lebanon, Wilson county, Tenn., Mr. J. M. Safford.

My cabinet and cabinet of Mr. Safford.

Diam. .34,

Length .53 of an inch.

Remarks.—I have three specimens before me from Mr. Safford; two of them are purple within and one white. None of them are perfect on the apex, but I presume that the number of whorls must be five. One of the specimens has four. In outline it is very much like *M. inflata*, (Nobis,) but it differs totally in the form of the columella. In that species the columella is twisted backwards, and makes an angular oblique channel—in the *pinguis* it is regularly curved, with scarcely a perceptible indentation in the place of a channel. The aperture is fully one-half the length of the shell.

MELANIA GIBBOSA. Pl. XXX. Fig. 12.

Testâ lævi, parvâ, obtuso-conoideâ, gibbosâ, subfusiformi, subtenui, virido-corneâ; spirâ obtusâ; suturis irregulariter impressis; anfractibus quinque, subconvexâ; aperturâ magnâ, ellipticâ, intus biocittatâ; columellâ rubiginosâ, incrassatâ, planulatâ, impressâ et valdè curvatâ.

Shell smooth, small, obtusely conical, gibbous, subfusiform, rather thin, greenish horn-colour; spire obtuse, sutures irregularly impressed; whorls five, somewhat convex; aperture large, elliptical, within double banded; columella rubiginose, thickened, flattened, impressed and much curved.

Hab. Scioto river, Ohio, Mr. C. M. Wheatley.

My cabinet and cabinet of Mr. Wheatley.

Diam. .25,

Length .43, of an inch.

Remarks.—This is a small, very remarkable species. There is a slight depression above the middle of the whorl, which gives it a somewhat gibbous form. The most unusual character pertaining to this species is, however, the very flat and impressed columella,

more impressed at the point of the umbilical region. The columella on the upper part of these two specimens is not thickened, but it is of a dark-brown colour, and being also dark below, the colour extends to the outer side of the whorl, and there makes two rather indistinct bands. In outline it is allied to *M. fusiformis*, (Nobis,) but they differ entirely in the columella and in the length of the aperture. The aperture is rather more than one-half the length of the shell.

I have had some doubts of the Scioto being the real habitat of this shell; but Mr. Wheatley says it was sent from thence to him. It seems to have a more southern aspect.

DESCRIPTION OF A NEW SPECIES OF HELIX,

FROM CALIFORNIA,

AND A NEW CHARACTERISTIC FORM OF CERTAIN AMERICAN COLIMACEÆ.

HELIX LECONTII. Pl. XXX. Fig. 13.

Testâ plano-convexâ, infernè convexâ, papillosâ, bruneo-corneâ, latè umbilicatâ, tridentatâ, intus columnâ accessione instructâ; anfractibus senis; aperturâ subrotundatâ, constrictâ; labro hipatico, reflexo, bidentato; columellâ uno-dentatâ.

Shell plano-convex, convex below, papillose, brownish horn-colour, widely umbilicated, three toothed, furnished with an accessory column within; whorls six; aperture rounded, constricted; outer lip dull-brown, reflexed, two-toothed; columella one-toothed.

Hab. St. Francisco, J. L. Le Conte, M. D.

My cabinet and cabinet of Dr. Le Conte.

Diam. .27,

Length .15, of an inch.

Remarks.—This is a very beautiful little species, which is allied in some of its characters to *hirsuta*, Say, *inflecta*, Say, and *Leai*, Ward. It is about the size, outline and colour of the last, and the umbilicus is of the same size. It differs, however, in the teeth, the *Leai* having none on the outer lip; and in the papillæ, which are smaller, rounder and closer in the *Leai*. The tooth on the columella is alike in both, being long, white, and incurved. Like the *inflecta*, it has two teeth on the outer lip, but these are much larger and whiter in the *inflecta*, which differs also in having the umbilicus closed, and in the papillæ being less distinct. In colour it is like a brown *hirsuta*, but it differs in being smaller, in being umbilicate, and in having two teeth on the outer lip, instead of a sinus, as in *hirsuta*, which has a much larger tooth on the columella, and a much more constricted aperture.

Fig. 13, b represents the papillæ enlarged.

Neither of the few specimens brought by Dr. Le Conte has the animal alive, which, of course, will remain yet to be described. The papillæ cover the whole surface. On the upper portion of the whorls they are close and elongate, passing into the form of striæ. On the lower portion they are more rounded and beautifully displayed. It is very probable that in some very perfect specimens, they may be found to have a hirsute character.

I dedicate this species to Dr. Le Conte, whose enterprising researches in California have brought to our knowledge many new forms in other branches of natural history.

Accessory Column in the Family Colimacea.

When recently examining very closely the structure of some of our *Helices*, I observed what had before escaped my attention, a pillar or an additional column, placed like a fulcrum (buttress) in the interior, against the wall of the ordinary column, at the distance of a fifth to a third of a revolution of the whorl from the aperture. I first observed it on the *Carocolla spinosa*, (Nobis,) and followed up this discovery until I detected it in a number of species and three different genera, admitting *Carocolla*, of Lamarck, and *Polygyra*, of Say, to be distinct genera, which I think it better at present to recognise.

This fulcrum, as I propose to call it, in distinction from the central column, varies in form, in size and in place in different species; and at a future period I may give a more exact account and a fuller description than I am enabled at present to take the time to do. It is generally visible from the exterior by the naked eye, when the specimen is thin and in a perfect state. With the assistance of a lens it may be easily seen, though not perfectly examined and defined. For this purpose it is necessary to fracture the portion of the shell in the vicinity of the *fulcrum*. It will be found in some species to be a simple round column soldered to the paries of the main column; in others, a compressed or flattened column, extending into the cavity of the whorl.

The purpose of this *fulcrum* or buttress is very evidently instituted for the greater strength of the ultimate whorl, which being very much enlarged, seems, in some of these more delicate species to require additional support.

I have detected the fulcrum in the following species, and as several of the species of Dr. Binney and Dr. Gould are unknown to me, I think it likely to be found in some of them.

Carocolla spinosa, Lea.

“ *Edgariana*, Lea.

Helix hirsuta, Say.

“ *monodon*, Racket.

“ *Leai*, Ward.

Helix leporina, Gould.

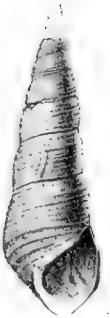
“ *Lecontii*, Lea.

Polygyra Troostiana, Lea.

“ *Dorfuilliana*, Lea.

It is due to my friend Dr. Leidy to say, that, when I informed him, some months since, of my having observed this *fulcrum* in many of the *Helices*, that he at once informed me that while engaged on the anatomical portion of Dr. Binney's work, which he accomplished for that zoologist, he had observed in the *Helix hirsuta* this character of the shell, and advised Dr. Binney of it at the time. But it seems that he did not take advantage of Dr. Leidy's information, or he may not have himself detected, on examination, this important additional character to these species.

While I have the *Polygyra Troostiana* and *P. Dorfuilliana* before me, I will take the opportunity to express my dissent to these species being placed by Dr. Binney and Dr. Gould, as synonymous with *Helix fatigiata*, Say. They are not only entirely distinct from *fatigiata*, but are distinct in themselves, and I am sure that zoologists who may



Nautilus *Edwardsi*
Nautilus *perforatus*
Nautilus *sculptus*
Nautilus *Clarki*

Nautilus *truncatus*
Nautilus *obliquus*
Nautilus *curvus*
Nautilus *Selleriana*
Nautilus *oppositus*

Nautilus *barbatus*
Nautilus *pungens*
Nautilus *gibbosus*
Nautilus *luculentus*

procure good specimens of both, will, on a critical examination, declare them to be different from each other and distinct from *fuligata*.

In the very learned and elaborate work of the late Dr. Binney, "Terrestrial Air-Breathing Mollusks of the United States," he takes occasion to state his strong disapprobation of the use of personal names for species in natural history, and at the same time points out a case where he considered it had been carried, to an abuse by a naturalist of this city. I wish simply, in answer, to give an opinion on the subject, first premising, that Dr. Binney had himself, in at least two instances, applied personal names to his own species, few of which he made, committing a graver error than those who do not disapprove of the use of personal names.

There are several reasons, in my opinion, why they may be used:

1st. Most of the great naturalists, for nearly one hundred years, have used them without hesitation; and the most distinguished of modern writers have sanctioned the example by following it; as Lamarck, in *Helix Bonplandii*, &c.; Ferussac, in *Helix Richardii*, &c., as well also other eminent writers in various branches of natural history.

2d. It is a good substitute, where a well recognised descriptive name cannot be applied, which is often the case.

3d. It is an honourable acknowledgment of services performed by co-labourers in the field of science, and it is a gratification due to ardent collectors, who labour for the man of science at a distance, and often in parts of the world subject to disease and other dangers.

Some very distinguished naturalists have gone much beyond the simple use of proper names for species, for they have applied them even to genera. For instance, Lesueur's genus *Macluria*; Tremenville's genus *Rissoa*; D'Orbigny's genus *Acostæa*, &c. &c.

In botany, personal names thus applied to *genera* have been most extensively used. In zoology I do not consider this necessary or desirable, but I do think there is not only a convenience in using such names for species, but sometimes almost an imperative necessity for it. In very extensive genera, where many hundred species abound, as in the genera *Unio*, *Melania*, *Conus*, &c., &c., it would be impossible to obtain descriptive names for all.

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Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The number of transformed cells was determined by the number of colonies growing on the selective medium. The results are the mean of three independent experiments. Error bars represent standard deviation.



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